

SEQUENCE LISTING

<110> Københavns Universitet
Louise Jørgensen
5 Pamela Magistrado
Thomas Lavstsen
Ali Salanti
Morten A. Nielsen
Trine Staalsø
10 Lars Hviid
Thor Theander
Anja Jensen

<120> COMPOUNDS USEFUL IN THE DIAGNOSIS AND TREATMENT OF MALARIA
15 <130> P36017DK01

<160> 8

20 <170> FastSEQ for Windows Version 4.0

<210> 1
<211> 10662
<212> DNA
25 <213> Plasmodium falciparum

<220>
<221> gene
<222> (0)...(0)
30 <223> var gene PFD1235w

<400> 1
atggggatg catcatcatc agagggggag gctaaaaccc ctagtttaac agaaagtac 60
aacagtgcaa gaaatatttt ggaagggtat gccgaaagta taaaggaaca ggcataaaaa 120
35 gatgcaaaaa tacatggaca tcatttgaaa ggagattgg cgaaagcagt atttcgtcat 180
ccattttctg catatagacc taactatgga aatccgtcg aacttgat tagtttcat 240
actaatgtat ggcatcgtaa cgccagaagat agaaaatcctt gtcttttag tcgtcaaaa 300
cgttttcaa atgaagggtga agcagaatgt aatggtgta taataactgg taataaagg 360
gaatgtgggg catgtgcacc gtataggaga agacatataat gtgactataa ttgcaccat 420
40 ataaaacgaaa ataataataag gaataactcat gatttattgg ggaatttggt agttatggca 480
aggagtgaaag gtgaatctat tgtaaaagt catgaatata caggttatgg tatatacaaa 540
tcaggtatat gtacttctt tgctcgact ttgcagata taggagat tattcgagga 600
aaagatctgt atcgtcgtga tagtagaaaca gataaaattt aagagaattt aagaaaaattt 660
ttcgcgata tatataaaaga attgaagaat gggaaaggat gggcggaagc aaaagagttac 720
45 taccaagatg atggaactgg aaatttattt aaattaaggg aagcttggg ggcacttaac 780
agaaaagatg tggaaaggc attaacatgt agtgcgccaa gggatgctca atatttcata 840
aaatcaagcg tcagggatca aacattttca aatgattt gtggccatgg tgaacatgag 900
gttcttacaa atttagatta tgccctcaaa ttttacat ggtttgaaga atggcagaa 960
gagttttgtt gaataaaaaaa aataaaattt gggaaaggta aggaagcatg tcgtgatgac 1020
50 tcaaaaaat tatattgtt tcataatggg tatgactgtt cgaaaaactat tcgaataaaa 1080
gatattttgtt ctgataatcc taaatgtact ggggtttctg ttaaatgcaa agtttatggaa 1140
ctttgtttaa ggaatcaacg aaatgaattt gaaaaacaaa aaaaaaaaaata ttataaggaa 1200
atacagacat atacatcgaa ggacgctaaa actgatagta atattaataa cgaatattat 1260
aaggaaattttt atgacaaaact taaaatgtt ggtatgaaa cattgaacaa atttataaaa 1320
55 ttactaaatg aaggaaggta ttgtttaaagaa aaaatatcg gagaaggaa tattgatttt 1380
actatgactg gtgataaaaga cgcttttat cgctcagact attgc当地 atgtccctgaa 1440
tgtggagtcc aatgttagcgg tacaacatgc acaccaaaaa aagtgataca tccgaattgc 1500

	aaagataaaag	aaacttatga	gcctgggtat	gcaaaaacca	ctgatattac	tgtccttat	1560
	agtggtgatg	aagaaggta	tattgcacaa	aaattacaag	attttgtaa	tgataaaaat	1620
	aaagaaaatg	atgaaaacta	tgaaaaatgg	caatgcatt	ataaaaagtag	tgagattaat	1680
	aatgtcaaa	tgacaccatc	atcacacaaa	gttccaaaac	atggttacat	tatgtcattt	1740
5	tatgctttt	ttgatttgt	ggttaagaat	ttattaatag	atagtataaa	ttggaagaac	1800
	gatcttacga	attgtataaa	taataactaat	gttacgatt	gtaaaaatga	ttgtacacaca	1860
	aattgtaaat	gttttggaaaa	ttgggctaaa	acaaaagaaa	atgagtggaa	aaaagtgaag	1920
	acgatataca	aaaatgaaaaa	cggaaacacg	aacaattatt	ataaaaaact	taataaccat	1980
	tttcaaggtt	attttttca	cgttatgaaa	gagcttaaca	aagaagaaaaa	atggtataaa	2040
10	cttatggaag	atttaaaaaga	aaaaatttgat	tcttccaatt	tgaaaaatgg	tacgaaagat	2100
	tcagaaggcg	caataaaaagt	gttgttcgat	cactaaaag	atatagctga	aagatgcata	2160
	gacaataatt	caaaagattc	atgtccacct	tcagtgata	cgaaaacaaa	cccctgtgct	2220
	aaacctcctg	gtagtaaacc	cactaaaagt	gtaaaacaat	tagcggaca	tatcaacag	2280
	aaggcaca	aaacttttggg	tactcgtggt	ggtgaaagta	aattgaaggg	ggatgcaaca	2340
15	agagggacgt	ataaccttgg	aggtaaagga	aacacgttga	atggcgat	atgtaaaata	2400
	acaaaaaaatc	ataccaatga	tagtgcct	aatggtaac	catgtacagg	taaagataaa	2460
	gttaaaaacg	ggtttgcct	gaaaatagga	accccgtgga	caaataattgt	acaaaaaaaaa	2520
	aaaaaaaaagt	catacaaaga	cttctattt	cctcctcggc	gtcaacat	gtgtacatca	2580
	aatttagaaa	atttgagcac	gagtagcaaa	ggacttagta	atggtagtt	tgctagtcac	2640
20	tcattattag	gtgatgtatt	gctcgcagca	aaatttgaag	cacaaaagat	aataactagt	2700
	tataaaaata	agaataat	aaatatcaga	aaaagaataa	ctgacccaa	tgatcaagct	2760
	actgtatgtc	gtgctatacg	ttaca	gcccgtat	gagatattat	acgagggaaa	2820
	gacatgtgga	atataaaacag	tgatgcaaaa	gatcttcaag	atcgtttaga	aaaaatattt	2880
	aaaaccatta	atgaaaact	tccta	atccaaaaaa	gatatacgaa	ccgtgaaaat	2940
25	aaacat	tttacgtt	agactgg	gaagctaata	gacatcaagt	ttggagagct	3000
	atgaaatgt	caacaaaagg	catca	aacaattgt	atggtatccc	aatagaagat	3060
	tacatcccac	aacgatta	atggatgac	gaatggccg	aatggattt	caaaaagcag	3120
	tcacaggaat	atgagaag	ggaggagaag	tgtggatgt	gtacggtaa	gggtcagggt	3180
	gatggtaa	attgtacaca	gaaggataaa	gaatgtagtc	cgtcaagaa	agcatgtat	3240
30	gcatataaga	aggaaataga	aaaatggaa	aaacaatgga	aaacagtatc	agctatatac	3300
	caaataattat	acgcaaaagc	acgaattgtt	gctagtaat	gcccgtctgg	gtattataat	3360
	acggaagtac	agaagaaaga	ccgat	tatgacttct	tgtacgagtt	acattacaa	3420
	aatggtggca	aaaaaggtcc	tcctcctgt	acacatcctt	ataaatctgt	taacacacgt	3480
	gataaaacgt	atgccact	tgata	ccactgtgt	atagtactgc	tgcaaggat	3540
35	gtacaccaag	aagcacat	ttgtgattgt	aaggaacaac	acgtttttt	tgataataac	3600
	ggcaacaagg	agaagtatgc	ttttaagaat	ccaccaa	at	ggcgtgtaa	3660
	tgtatgacga	gggaggcacc	accaccacca	acaactcctt	ctactccaa	tccgtgtct	3720
	gaaactgg	gtgtacatac	cattaaaact	gtgactgat	tcgaaaaat	attacagggg	3780
	gaggcaaaatg	aaacaatgt	aaaaatagt	tccaa	atgataagga	tgagagtaaa	3840
40	ttgaaaggta	aggcagaaga	aggggattat	agtcgtggag	gtacgcaag	tgacttcaac	3900
	aacaatttat	gtggtataac	acaaaagcat	tccaa	at	acaacaacca	3960
	tgttatggaa	aaagatcaaaa	aagttcaat	gttaga	acgg	taagataat	4020
	catagaaaac	ggacacaccc	tgaggcatat	atgcctccaa	gaaggg	tatatgtaca	4080
	tcaaatttgg	aatatttaat	tcata	aaaaacca	ttat	tgatccta	4140
45	aagattattc	attccttatt	ggcgatgt	ttacttgcag	aaaat	agcagaaaac	4200
	ataaagaaac	tgtatgaa	aaataacaac	cgaaaagatc	agaaggat	atgtcgagct	4260
	atgaaatata	gttttgcaga	tataggggat	attattc	gaaaagat	gtggatagaa	4320
	aacaatgtat	ctaagagatt	acaaa	ttgaa	at	aattaaagaa	4380
	aaaactggag	gcaccacata	taatgaa	aacatccgt	at	acgtgcagat	4440
50	tggtggaa	ctaata	gagc	aaagcaat	aaat	aaatggcgta	4500
	gatatcactt	gtgatgt	tcata	ttggatgatt	at	aaatccccca	4560
	tggatgact	atgggcaga	atgg	aaagcgc	ca	aaatggat	4620
	gaggaga	gtatgt	caag	gtaa	gg	taagaagtt	4680
	acgaaggaa	gtac	caag	tgt	aa	ataaaaaaca	4740
55	tggcagatc	aatggaa	aatat	aaata	aaat	aaaagccaa	4800
	aatcctacta	atgctt	caa	aaag	aaat	tggtattgat	4860
	ttttgacac	aatt	aaat	ggc	gg	tggtgtgca	4920
	tctactgct	caggat	at	gca	gt	caccgttat	4980
	gagttt	tg	tg	ac	ga	gaaacaaagg	5040

catgggtatg	ctacagcgtg	tgattgcata	aataggcgc	aaacagagga	gccgaagaaa	5100	
aaggaagaaa	atgttagagag	tgcgtcaaa	atagtgaag	aagtctttc	gaaaccacga	5160	
gataaaaacta	caggtggat	agatcattgt	aatccaaagt	attatccaag	aaaagaaaat	5220	
tatcctggat	ggaattgtac	tccaggttag	tttaaatcag	gtcatgctgg	agcatgtatg	5280	
5	cctccaaagaa	gaataaaaatt	atgtgtatt	aatttacaat	atttgaatga	gaagaaaatca	5340
ccagaagaat	tgagaaaagc	ttttattcaa	tgcgtctcaa	tagaaacgta	ttgggttatgg	5400	
caaaaataca	aaaaggataa	gaatgggtgt	gttgcacaag	caaaattaaa	tagtggtacc	5460	
atccctgatg	actttaagcg	tcaaatagttc	tatacgtttg	gagattatag	agatttatgt	5520	
ttagatactg	atatatcatc	aaaagcagat	acaagtacag	gtgttaggtaa	agtaaaaatt	5580	
10	aatatagatt	ctgttttcca	aaaaatttgc	ataactaatg	togaacaacg	taaaccttgg	5640
tggggaaaaa	acgcagaagc	tattttggat	ggaatgttat	gtgttttaag	ttataatact	5700	
acaaacaaaa	atatggatta	caatgcacac	acaaaaattaa	atcccacgta	cggctacaac	5760	
gccataaaaat	ctgaactgga	agactttgtg	aacagacctc	aattccctcg	atggttcact	5820	
gaatggagtg	acgaattttg	tacagaacgt	agtataaaga	tcaaggagtt	gaaacaaaaa	5880	
15	tgttaacgatt	gtactgttag	tgagagtgg	actagtgtat	ctacgggtaa	taaaacatgt	5940
gatgataaaag	ataaaatgtga	cgagtcaaa	agagcatgt	caacatataa	aacttggctt	6000	
aaaaatttgg	aaactcaata	taaaacacaa	agcaaaaaat	attttgatga	taaaagaaaa	6060	
gaactatata	aaagtatcga	tgacgtcgcc	agttctacac	aagcctatca	atatttacat	6120	
gcacaattaa	aaaaactttg	tggtaatgt	gattgcaagt	gtatggatgg	tgagtccaaa	6180	
20	gaaacaaccg	gacagcctga	taactccac	gattccata	tgcctgcattc	attagatgt	6240
gaacccgaag	aagtgaatgg	aaagtgtat	tgtaaagtga	aacatcgtcc	acaacctccg	6300	
ctagcacttc	caccaccagc	accatcgaaa	cctccagctg	aagaccaaata	tgagcatgac	6360	
aatagaggac	gatcggaaacg	tggtgaccaa	ggcccactac	cagcgcgacc	tcctccccc	6420	
ccacaagctg	cacaaccacc	acaacaaaaa	ccaaaacgca	ctggagaagg	cctcggtcg	6480	
25	aatctaccac	cagctgacag	aaataccaat	ctctccgatt	cogaagaaga	agacgacgaa	6540
gatgacgacg	aagtccagga	ggaggaggaa	acgcccacgt	cgaggcgga	ggaaggtgaa	6600	
ggacacgtcg	agacagagga	ggagacgaa	ccggtaagg	aaaagacgga	aggggcgggg	6660	
gccacagaag	tcacaaaaca	gggtcggca	ccaaacggca	caacaccaac	agtagaagat	6720	
atttgcgcca	cagtggccaa	agcacttaag	ggcgacaaaa	gtctcaatgc	cgcattgtgc	6780	
30	ctcaaatatg	gcaaaaacaa	ctcacgtta	ggttggaaat	gtataccac	tagtggtgac	6840
aaaacacagaca	caagtggagaa	tgggccccca	cgtcgctgct	gtagtggccca	tggtggtaaa	6900	
agtgatagtg	aaaaagggttc	catatgtgt	ccgcccggaa	gacgacgatt	atataaaaa	6960	
aagatagtag	attgggcgga	atcacagtcg	aagacagtaa	caagtgttaa	tggagatgg	7020	
aatgggtcac	aggaagtagt	tagtggtaat	ggagctagtg	agagtgggtg	tagtggtagt	7080	
35	ggtactgagt	cacaggcgag	tgatgtgtca	caaggtaacg	gcmcgtcgac	atcggccacaa	7140
gtggctctcc	tccacgcctt	tgtgaagtcc	gctgcaatag	agacgtttt	tgcttggcat	7200	
aaatataaaag	tggataaaaga	aatagaggaa	aaggaaaaac	aggcagcaca	aaatcatcta	7260	
gttcaacgta	aaacaaggcga	gaaccccca	aagaaattag	aagggtgtga	aatacctgaa	7320	
gatttttaagc	gtcaaatagtt	ctatacttta	ggagattata	ggatatttt	agtgggggac	7380	
40	aagactatga	ttgaggcgtt	agaaaagagt	ggtgacacga	aatagaaga	tatatcgaa	7440
aaaataccaa	aaattttaga	tggtgagaac	aacaaagctg	ctgggtgtgg	ccccaaacaa	7500	
ccaaatagtg	gtaaaacacc	acaagaatgg	tggaaagaaa	acgcaaaaca	catttggcat	7560	
ggaatgatat	gtgttttaac	atacaacaca	gacagtaatg	gaaaggacaa	aaaataacaa	7620	
caggttaaag	ctacggacaa	cacagatctt	ttccaaaaac	tggaaaaaaa	caacgactac	7680	
45	gaaactgtgt	catttgggtc	tagtggtacc	ggcgccaaaa	gcaacgacga	taccaaatta	7740
aaaaattttt	tggtacgccc	cacatatttt	cgttggtag	agaatgggg	agaagagttt	7800	
tgtcgaaaac	aaaaacataa	gttataatata	attaaaaaaag	attgtcgta	taataagttt	7860	
tgttagtgg	atggcttgcg	ttgtgacgaa	aaagttccag	ataagaaaga	tatttttaag	7920	
catttcgatt	gtcccagttg	tgccagacat	tgttagatctt	atagaaaatg	gatagaaaga	7980	
50	aaaaaaacag	aatatgagaa	acaagaaacg	gcatatagta	aacaaaaaaag	taattacgta	8040
aatggaaagta	atgggtatgg	aggttataat	aatgataaaag	aattttcac	aaaactagaa	8100	
acgtgcacta	aagcaacaaa	cttttttagaa	tcattaaaag	gacaatgtat	tggtaataat	8160	
aatggaggca	ctgacataaa	attttagtaat	acaaatataa	catttggatc	tgcagaagat	8220	
tgttaaacctt	gttctgaatt	taaagtaat	tgtgaaaatg	gtagttgtgg	gagtgtctaag	8280	
55	caaaaggatt	gcccaaataa	tacgattact	tcacaaaata	ttaaaggct	tactgaccaa	8340
gtagatatgc	gtgttagtga	taacactgaa	agtggatttg	aagggtgattt	aggcattttgt	8400	
cagggtgcag	gtatatttaa	aggttattaga	aaagatgaat	gaaaatgtgg	tgatttctgt	8460	
ggtatagata	tatgtactct	ggaaaaaaacc	aataatggga	aagaaagcga	taaaaaaatat	8520	
atcataatga	aagaattcgt	taaaagatgg	ctagaatatt	tttttgaaga	ttataataga	8580	

attcaaaaaa aattaaagac atgtaaagaa aatggtaaag gatccacatg tataagaagt 8640
 tgtgtatgt aatggataaa gctgaaaaag gatgaatggc aaaaaattaa cagtaattac 8700
 cttgacccaa atacaaaaga aaatcctgaa ggtataatt taagctctt tttggaggat 8760
 ggaccgttia agaatgaggt tgataaagct ataaaacctt gtggtaattt aactgatttc 8820
 5 aagaagtcaa agaaatgtaa tggcacttcc agatcaggaa atagtgaaga gagcacaaaa 8880
 tatgatggtg ttatatgtt gcttgataat cttaaaaaca taataaaaac ttgtcaaaac 8940
 gtacctagtg gcaaaccaga tacaccgtgt caaaaatccc ccgcccccg tggagacgat 9000
 gatgatcccc ttgaagagga aaaccagta acacaaccga acatttgc tcc gcaaacatca 9060
 gtggaagaaa aaaaaaaaaga ggaagaagaa aagtgtatg aaaaggagga agaagaagaa 9120
 10 aaagaggagg aaaaagataa aggagatgag gaagtaaaag aagaagaaaa agataaagga 9180
 gatgaggaag aagaagcaga agaagaagaa gaagaagaag agaaacaga tagtcacatt 9240
 tatgaagact actctgttcc agacgcagag gaagatgatg aagatgaagc ttttacagaa 9300
 tccttatcac cttcagagtc acaaccaaaa cgattgtac gagaatttcc atccccgaa 9360
 ttaaaaaatg ccatgttatt ttctaccatc ctctggatgg taggtatcgg ttttgcggcg 9420
 15 ttcacttatt ttttctaaa gaaaaaaccg aaatcacctg ttgacctctt acgtgtactt 9480
 gacatccata aaggcgatta tggAACACCT accccgaaat caaaaaatag atatatcccc 9540
 tatgtgagtg atacatataa agggaaaaca tacttataatg ttgaaggaga tacagacgaa 9600
 gagaaatata tgttctgtc tgataactact gatataacct ctccgaaag tgagtatgaa 9660
 gaattggata ttaatgatat atatgtacca ggtgtccta aatataaaaac attgatagaa 9720
 20 gtagtattgg aaccatcaa aagtgtatgg aacacaccag gtaagggtga tggtaacaca 9780
 ctaggtgatg atatggtacc taccacgaat acatttacag atgaggaatg gaatgaactg 9840
 aaacaggatt ttgtatcaca atatatacaa agtagattac caatggatgt accacaatat 9900
 gatgtatcaa cggagagtcc aatgaatata ggaggtatg ttttagatga tggatggat 9960
 gaaaaacctt ttattactt tattcatgtat agggatttaa atagtggaga agaaattagt 10020
 25 tataatattc atatgagtac taacactaat aatgatattc caaaatatgt atcaaataat 10080
 gtatattctg gtatagattt aattaatgtat acattaatgt ataacaaca tattgatata 10140
 tatgtatgaa tgctaaaaag aaaagaaaaat gaattatgg gaacaaattha taagaaaaat 10200
 acatcaaaca atagtgtatc aaaaaataact aatagtgtatc caattatgaa ccaattatgt 10260
 ttgttacata aatggataga tagacataga gatataatgtg aaaattgggg gaaaaaagaa 10320
 30 gatatttga ataaattgaa tgaacaatgg aataaaagata atgatggtg tgatatacca 10380
 aatgataaca aaaagttgaa tacggatgtt tcgataaaaa tagatatgaa tgaaactaaa 10440
 gaaaaagaagg aatttatgaa tatggataact atcttggatg atatggaa tgatataat 10500
 tatgtatgaa atgtatgaaaa cccatctgtc gatgatatac ctatggatca taataaaagta 10560
 gatgtaccaa agaaagtaca tggatggatggaaaatccta ataatacatc taatggatcg 10620
 35 ttggaaacaac aatttcctat atcgatgtt tggatataat aa 10662

40 <210> 2
 <211> 3553
 <212> PRT
 <213> Plasmodium falciparum

<400> 2

45	Met	Gly	Asn	Ala	Ser	Ser	Ser	Glu	Gly	Glu	Ala	Lys	Thr	Pro	Ser	Leu
	1			5						10				15		
	Thr	Glu	Ser	His	Asn	Ser	Ala	Arg	Asn	Ile	Leu	Glu	Gly	Tyr	Ala	Glu
				20				25						30		
	Ser	Ile	Lys	Glu	Gln	Ala	Ser	Lys	Asp	Ala	Lys	Ile	His	Gly	His	His
50		35				40						45				
	Leu	Lys	Gly	Asp	Leu	Ala	Lys	Ala	Val	Phe	Arg	His	Pro	Phe	Ser	Ala
		50			55						60					
	Tyr	Arg	Pro	Asn	Tyr	Gly	Asn	Pro	Cys	Glu	Leu	Asp	Tyr	Arg	Phe	His
		65			70						75			80		
55	Thr	Asn	Val	Trp	His	Arg	Asn	Ala	Glu	Asp	Arg	Asn	Pro	Cys	Leu	Phe
				85						90			95			
	Ser	Arg	Ala	Lys	Arg	Phe	Ser	Asn	Glu	Gly	Glu	Ala	Glu	Cys	Asn	Gly
		100				105						110				
	Gly	Ile	Ile	Thr	Gly	Asn	Lys	Gly	Glu	Cys	Gly	Ala	Cys	Ala	Pro	Tyr

115	120	125	
Arg Arg Arg His Ile Cys Asp Tyr Asn Leu His His Ile Asn Glu Asn			
130	135	140	
Asn Ile Arg Asn Thr His Asp Leu Leu Gly Asn Leu Leu Val Met Ala			
5 145	150	155	160
Arg Ser Glu Gly Glu Ser Ile Val Lys Ser His Glu Tyr Thr Gly Tyr			
165	170	175	
Gly Ile Tyr Lys Ser Gly Ile Cys Thr Ser Leu Ala Arg Ser Phe Ala			
180	185	190	
10 Asp Ile Gly Asp Ile Ile Arg Gly Lys Asp Leu Tyr Arg Arg Asp Ser			
195	200	205	
Arg Thr Asp Lys Leu Glu Glu Asn Leu Arg Lys Ile Phe Ala Asn Ile			
210	215	220	
Tyr Lys Glu Leu Lys Asn Gly Lys Lys Trp Ala Glu Ala Lys Glu Tyr			
15 225	230	235	240
Tyr Gln Asp Asp Gly Thr Gly Asn Tyr Tyr Lys Leu Arg Glu Ala Trp			
245	250	255	
Trp Ala Leu Asn Arg Lys Asp Val Trp Lys Ala Leu Thr Cys Ser Ala			
260	265	270	
20 Pro Arg Asp Ala Gln Tyr Phe Ile Lys Ser Ser Val Arg Asp Gln Thr			
275	280	285	
Phe Ser Asn Asp Tyr Cys Gly His Gly Glu His Glu Val Leu Thr Asn			
290	295	300	
Leu Asp Tyr Val Pro Gln Phe Leu Arg Trp Phe Glu Glu Trp Ala Glu			
25 305	310	315	320
Glu Phe Cys Arg Ile Lys Lys Ile Lys Leu Gly Lys Val Lys Glu Ala			
325	330	335	
Cys Arg Asp Asp Ser Lys Lys Leu Tyr Cys Ser His Asn Gly Tyr Asp			
340	345	350	
30 Cys Thr Lys Thr Ile Arg Asn Lys Asp Ile Leu Ser Asp Asn Pro Lys			
355	360	365	
Cys Thr Gly Cys Ser Val Lys Cys Lys Val Tyr Glu Leu Trp Leu Arg			
370	375	380	
Asn Gln Arg Asn Glu Phe Glu Lys Gln Lys Lys Tyr Tyr Lys Glu			
35 385	390	395	400
Ile Gln Thr Tyr Thr Ser Lys Asp Ala Lys Thr Asp Ser Asn Ile Asn			
405	410	415	
Asn Glu Tyr Tyr Lys Glu Phe Tyr Asp Lys Leu Lys Asn Glu Gly Tyr			
420	425	430	
40 Glu Thr Leu Asn Lys Phe Ile Lys Leu Leu Asn Glu Gly Arg Tyr Cys			
435	440	445	
Lys Glu Lys Ile Ser Gly Glu Arg Asn Ile Asp Phe Thr Met Thr Gly			
450	455	460	
Asp Lys Asp Ala Phe Tyr Arg Ser Asp Tyr Cys Gln Ile Cys Pro Glu			
45 465	470	475	480
Cys Gly Val Gln Cys Ser Gly Thr Thr Cys Thr Pro Lys Lys Val Ile			
485	490	495	
His Pro Asn Cys Lys Asp Lys Glu Thr Tyr Glu Pro Gly Asp Ala Lys			
500	505	510	
50 Thr Thr Asp Ile Thr Val Leu Tyr Ser Gly Asp Glu Glu Gly Asp Ile			
515	520	525	
Ala Gln Lys Leu Gln Asp Phe Cys Asn Asp Lys Asn Lys Glu Asn Asp			
530	535	540	
Glu Asn Tyr Glu Lys Trp Gln Cys Tyr Tyr Lys Ser Ser Glu Ile Asn			
55 545	550	555	560
Lys Cys Gln Met Thr Pro Ser Ser His Lys Val Pro Lys His Gly Tyr			
565	570	575	
Ile Met Ser Phe Tyr Ala Phe Phe Asp Leu Trp Val Lys Asn Leu Leu			
580	585	590	

105	Ile	Asp	Ser	Ile	Asn	Trp	Lys	Asn	Asp	Leu	Thr	Asn	Cys	Ile	Asn	Asn	
	595						600						605				
110	Thr	Asn	Val	Thr	Asp	Cys	Lys	Asn	Asp	Cys	Asn	Thr	Asn	Cys	Lys	Cys	
	610						615					620					
115	5	Phe	Glu	Asn	Trp	Ala	Lys	Thr	Lys	Glu	Asn	Glu	Trp	Lys	Lys	Val	Lys
	625						630					635				640	
120	Thr	Ile	Tyr	Lys	Asn	Glu	Asn	Gly	Asn	Thr	Asn	Asn	Tyr	Tyr	Lys	Lys	
	645						650					655					
125	Leu	Asn	Asn	His	Phe	Gln	Gly	Tyr	Phe	Phe	His	Val	Met	Lys	Glu	Leu	
	660						665					670					
130	Asn	Lys	Glu	Glu	Lys	Trp	Tyr	Lys	Leu	Met	Glu	Asp	Leu	Lys	Glu	Lys	
	675						680					685					
135	Ile	Asp	Ser	Ser	Asn	Leu	Lys	Asn	Gly	Thr	Lys	Asp	Ser	Glu	Gly	Ala	
	690						695					700					
140	15	Ile	Lys	Val	Leu	Phe	Asp	His	Leu	Lys	Asp	Ile	Ala	Glu	Arg	Cys	Ile
	705						710					715				720	
145	Asp	Asn	Asn	Ser	Lys	Asp	Ser	Cys	Pro	Pro	Ser	Val	Asp	Thr	Lys	Thr	
	725						730					735					
150	20	Asn	Pro	Cys	Ala	Lys	Pro	Pro	Gly	Ser	Lys	Pro	Thr	Lys	Ser	Val	Lys
	740						745					750					
155	Gln	Leu	Ala	Glu	His	Met	Gln	Gln	Lys	Ala	Gln	Lys	Leu	Leu	Gly	Thr	
	755						760					765					
160	Arg	Gly	Gly	Glu	Ser	Lys	Leu	Lys	Gly	Asp	Ala	Thr	Arg	Gly	Thr	Tyr	
	770						775					780					
165	25	Asn	Leu	Gly	Gly	Gln	Gly	Asn	Thr	Leu	Asn	Gly	Asp	Ile	Cys	Lys	Ile
	785						790					795				800	
170	Thr	Lys	Asn	His	Thr	Asn	Asp	Ser	Arg	Pro	Asn	Gly	Glu	Pro	Cys	Thr	
	805						810					815					
175	30	Gly	Lys	Asp	Lys	Val	Lys	Asn	Gly	Phe	Arg	Leu	Lys	Ile	Gly	Thr	Pro
	820						825					830					
180	Trp	Thr	Asn	Ile	Val	Gln	Lys	Lys	Lys	Lys	Ser	Tyr	Lys	Asp	Phe		
	835						840					845					
185	Tyr	Leu	Pro	Pro	Arg	Arg	Gln	His	Met	Cys	Thr	Ser	Asn	Leu	Glu	Asn	
	850						855					860					
190	35	Leu	Ser	Thr	Ser	Ser	Lys	Gly	Leu	Ser	Asn	Gly	Ser	Phe	Ala	Ser	His
	865						870					875				880	
195	Ser	Leu	Leu	Gly	Asp	Val	Leu	Leu	Ala	Ala	Lys	Phe	Glu	Ala	Gln	Lys	
	885						890					895					
200	200	Ile	Ile	Leu	Val	Tyr	Lys	Asn	Lys	Asn	Ile	Asn	Ile	Arg	Lys	Arg	
	900						905					910					
205	Ile	Thr	Asp	Pro	Asn	Asp	Gln	Ala	Thr	Val	Cys	Arg	Ala	Ile	Arg	Tyr	
	915						920					925					
210	Ser	Phe	Ala	Asp	Leu	Gly	Asp	Ile	Ile	Arg	Gly	Lys	Asp	Met	Trp	Asn	
	930						935					940					
215	250	Ile	Asn	Ser	Asp	Ala	Lys	Asp	Leu	Gln	Asp	Arg	Leu	Glu	Lys	Ile	Phe
	945						950					955				960	
220	Lys	Thr	Ile	Asn	Glu	Lys	Leu	Pro	Asn	Glu	Ile	Gln	Lys	Arg	Tyr	Thr	
	965						970					975					
225	Asn	Arg	Glu	Asn	Lys	His	Leu	Asp	Leu	Arg	Ser	Asp	Trp	Trp	Glu	Ala	
	980						985					990					
230	230	Asn	Arg	His	Gln	Val	Trp	Arg	Ala	Met	Lys	Cys	Ala	Thr	Lys	Gly	Ile
	995						1000					1005					
235	Ser	Asn	Asn	Asn	Cys	Asn	Gly	Ile	Pro	Ile	Glu	Asp	Tyr	Ile	Pro	Gln	
	1010						1015					1020					
240	240	55	Arg	Leu	Arg	Trp	Met	Thr	Glu	Trp	Ala	Glu	Trp	Tyr	Cys	Lys	Gln
	1025						1030					1035				1040	
245	Ser	Gln	Glu	Tyr	Glu	Lys	Leu	Glu	Glu	Lys	Cys	Gly	Met	Cys	Thr	Gly	
	1045						1050					1055					
250	Lys	Gly	Gln	Gly	Asp	Gly	Lys	Asp	Cys	Thr	Gln	Lys	Asp	Lys	Glu	Cys	

	1060	1065	1070
Ser Pro Cys Lys Lys Ala Cys Asp Ala Tyr Lys Lys Glu Ile Glu Lys			
1075	1080	1085	
Trp Glu Lys Gln Trp Lys Thr Val Ser Ala Ile Tyr Gln Ile Leu Tyr			
5 1090	1095	1100	
Ala Lys Ala Arg Ile Val Ala Ser Asn Gly Gly Pro Gly Tyr Tyr Asn			
1105	1110	1115	1120
Thr Glu Val Gln Lys Lys Asp Arg Ser Val Tyr Asp Phe Leu Tyr Glu			
1125	1130	1135	
10 Leu His Leu Gln Asn Gly Gly Lys Lys Gly Pro Pro Pro Ala Thr His			
1140	1145	1150	
Pro Tyr Lys Ser Val Asn Thr Arg Asp Lys Arg Asp Ala Thr Asp Asp			
1155	1160	1165	
Thr Thr Pro Thr Val Tyr Ser Thr Ala Ala Gly Tyr Val His Gln Glu			
15 1170	1175	1180	
Ala His Ile Gly Asp Cys Lys Glu Gln His Val Phe Cys Asp Asn Asn			
1185	1190	1195	1200
Gly Asn Lys Glu Lys Tyr Ala Phe Lys Asn Pro Pro Asn Val Tyr Val			
1205	1210	1215	
20 Glu Ala Cys Lys Cys Met Thr Arg Glu Ala Pro Pro Pro Pro Thr Thr			
1220	1225	1230	
Pro Ser Thr Pro Asn Pro Cys Ala Glu Thr Gly Gly Val His Thr Ile			
1235	1240	1245	
Lys Thr Val Thr Asp Val Ala Lys Ile Leu Gln Gly Glu Ala Asn Glu			
25 1250	1255	1260	
Thr Met Leu Lys Asn Ser Ser Asn Gly Asn Asp Lys Asp Glu Ser Lys			
1265	1270	1275	1280
Leu Lys Gly Lys Ala Glu Glu Gly Asp Tyr Ser Arg Gly Gly Thr Pro			
1285	1290	1295	
30 Ser Asp Phe Asn Asn Asn Leu Cys Gly Ile Thr Gln Lys His Ser Asn			
1300	1305	1310	
Ala His Asn Asp Ser Gln Gln Pro Cys Tyr Gly Lys Asp Gln Lys Arg			
1315	1320	1325	
Phe Asn Val Gly Thr Glu Trp Ser Phe Lys Asp Asn His Arg Lys Arg			
35 1330	1335	1340	
Thr His Pro Glu Ala Tyr Met Pro Pro Arg Arg Glu His Ile Cys Thr			
1345	1350	1355	1360
Ser Asn Leu Glu Tyr Leu Ile His Lys Arg Lys Lys Pro Ile Ile Glu			
1365	1370	1375	
40 Gly Asp Pro Asn Lys Ile Ile His Ser Leu Leu Gly Asp Val Leu Leu			
1380	1385	1390	
Ala Ala Lys Tyr Glu Ala Glu Asn Ile Lys Lys Leu Tyr Glu Glu Asn			
1395	1400	1405	
Asn Asn Arg Lys Asp Gln Glu Gly Ile Cys Arg Ala Met Lys Tyr Ser			
45 1410	1415	1420	
Phe Ala Asp Ile Gly Asp Ile Ile Arg Gly Lys Asp Met Trp Ile Glu			
1425	1430	1435	1440
Asn Asn Asp Ala Lys Arg Leu Gln Thr Asn Leu Lys Glu Ile Phe Thr			
1445	1450	1455	
50 Lys Ile Lys Glu Lys Thr Gly Gly Thr Thr Tyr Asn Glu Asp Asn Asp			
1460	1465	1470	
Pro Tyr Leu Lys Leu Arg Ala Asp Trp Trp Glu Ala Asn Arg Ala Lys			
1475	1480	1485	
55 Val Trp Lys Ala Met Lys Cys Lys Thr Asn Gly Val Asp Ile Thr Cys			
1490	1495	1500	
Asp Ser Asp His Thr Pro Leu Asp Asp Tyr Ile Pro Gln Arg Leu Arg			
1505	1510	1515	1520
Trp Met Thr Glu Trp Ala Glu Trp Tyr Cys Lys Ala Gln Ser Gln Glu			
1525	1530	1535	

Tyr Lys Lys Leu Glu Glu Lys Cys Ser Gln Cys Lys Ser Lys Gly Lys
 1540 1545 1550
 Gly Gly Asn Glu Cys Tyr Arg Glu Thr Lys Glu Cys Asn Asp Cys Lys
 1555 1560 1565
 5 Gln Ala Cys Glu Glu Tyr Lys Arg Lys Ile Lys Thr Trp Ala Asp Gln
 1570 1575 1580
 Trp Lys Val Ile Ser Asn Lys Tyr Glu Asp Leu Tyr Lys Lys Ala Gln
 1585 1590 1595 1600
 Asn Pro Thr Asn Ala Val Leu Lys Asp Asn Lys Asp Glu Lys Asp Lys
 10 1605 1610 1615
 Asn Val Ile Asp Phe Leu Thr Gln Leu Gln Lys Ala Asn Asn Gly Glu
 1620 1625 1630
 Lys Thr Gly Val His Thr Val Tyr Ser Thr Ala Ala Gly Tyr Ile His
 1635 1640 1645
 15 Gln Glu Ala Arg Thr Arg Glu Cys Gln Glu Gln Arg Glu Phe Cys Asp
 1650 1655 1660
 Lys Lys Asn Gly Ile Asp Asn Thr Ser Tyr Ala Phe Lys Asp Pro Pro
 1665 1670 1675 1680
 His Gly Tyr Ala Thr Ala Cys Asp Cys Ile Asn Arg Ser Gln Thr Glu
 20 1685 1690 1695
 Glu Pro Lys Lys Glu Glu Asn Val Glu Ser Ala Cys Lys Ile Val
 1700 1705 1710
 Glu Glu Val Leu Ser Lys Pro Arg Asp Lys Thr Thr Gly Gly Ile Asp
 1715 1720 1725
 25 His Cys Asn Pro Lys Tyr Tyr Pro Arg Lys Glu Asn Tyr Pro Gly Trp
 1730 1735 1740
 Asn Cys Thr Pro Gly Gln Phe Lys Ser Gly His Ala Gly Ala Cys Met
 1745 1750 1755 1760
 Pro Pro Arg Arg Ile Lys Leu Cys Val Ile Asn Leu Gln Tyr Leu Asn
 30 1765 1770 1775
 Glu Lys Lys Ser Pro Glu Glu Leu Arg Lys Ala Phe Ile Gln Cys Ala
 1780 1785 1790
 Ala Ile Glu Thr Tyr Trp Leu Trp Gln Lys Tyr Lys Lys Asp Lys Asn
 1795 1800 1805
 35 Gly Gly Val Ala Gln Ala Lys Leu Asn Ser Gly Thr Ile Pro Asp Asp
 1810 1815 1820
 Phe Lys Arg Gln Met Phe Tyr Thr Phe Gly Asp Tyr Arg Asp Leu Cys
 1825 1830 1835 1840
 Leu Asp Thr Asp Ile Ser Ser Lys Ala Asp Thr Ser Thr Gly Val Gly
 40 1845 1850 1855
 Lys Val Lys Ile Asn Ile Asp Ser Val Phe Gln Lys Ile Asp Ile Thr
 1860 1865 1870
 Asn Val Glu Gln Arg Lys Pro Trp Trp Gly Lys Asn Ala Glu Ala Ile
 1875 1880 1885
 45 Trp Asp Gly Met Leu Cys Ala Leu Ser Tyr Asn Thr Thr Asn Lys Asn
 1890 1895 1900
 Met Asp Tyr Asn Ala His Thr Lys Leu Asn Pro Thr Tyr Gly Tyr Asn
 1905 1910 1915 1920
 Ala Ile Lys Ser Glu Leu Glu Asp Phe Val Asn Arg Pro Gln Phe Leu
 50 1925 1930 1935
 Arg Trp Phe Thr Glu Trp Ser Asp Glu Phe Cys Thr Glu Arg Ser Ile
 1940 1945 1950
 Lys Ile Lys Glu Leu Glu Thr Lys Cys Asn Asp Cys Thr Val Ser Glu
 1955 1960 1965
 55 Ser Gly Thr Ser Asp Ala Thr Gly Asn Lys Thr Cys Asp Asp Lys Asp
 1970 1975 1980
 Lys Cys Asp Glu Cys Lys Arg Ala Cys Thr Thr Tyr Lys Thr Trp Leu
 1985 1990 1995 2000
 Lys Asn Trp Lys Thr Gln Tyr Lys Thr Gln Ser Lys Lys Tyr Phe Asp

	2005	2010	2015
	Asp Lys Arg Lys Glu Leu Tyr Lys Ser Ile Asp Asp Val Ala Ser Ser		
	2020	2025	2030
5	Thr Gln Ala Tyr Gln Tyr Leu His Ala Gln Leu Lys Lys Leu Cys Gly		
	2035	2040	2045
	Asn Ala Asp Cys Lys Cys Met Asp Gly Glu Ser Lys Glu Thr Thr Gly		
	2050	2055	2060
	Gln Pro Asp Asn Ser His Asp Ser His Met Pro Ala Ser Leu Asp Asp		
	2065	2070	2075
10	Glu Pro Glu Glu Val Asn Gly Lys Cys Asn Cys Lys Val Lys His Arg		
	2085	2090	2095
	Pro Gln Pro Pro Leu Ala Leu Pro Pro Ala Pro Ser Gly Pro Pro		
	2100	2105	2110
	Ala Glu Asp Gln Ile Glu His Asp Asn Arg Gly Arg Ser Glu Arg Gly		
15	2115	2120	2125
	Asp Gln Gly Pro Leu Pro Ala Arg Pro Pro Pro Pro Gln Ala Ala		
	2130	2135	2140
	Gln Pro Pro Gln Pro Lys Pro Lys Arg Thr Gly Glu Gly Leu Gly Arg		
	2145	2150	2155
20	2160	2165	2170
	Asn Leu Pro Pro Ala Asp Arg Asn Thr Asn Leu Ser Asp Ser Glu Glu		
	2175		
	Glu Asp Asp Glu Asp Asp Glu Val Gln Glu Glu Glu Glu Thr Pro		
	2180	2185	2190
	Pro Ser Glu Ala Glu Glu Gly Glu His Val Glu Thr Glu Glu Glu		
25	2195	2200	2205
	Thr Lys Pro Val Lys Glu Lys Thr Glu Gly Ala Gly Ala Thr Glu Val		
	2210	2215	2220
	Thr Lys Gln Gly Ser Ala Pro Thr Ala Thr Thr Pro Thr Val Glu Asp		
	2225	2230	2235
30	2240	2245	2250
	Ile Cys Ala Thr Val Ala Lys Ala Leu Lys Gly Asp Lys Ser Leu Asn		
	2255		
	Ala Ala Cys Ala Leu Lys Tyr Gly Lys Asn Asn Ser Arg Leu Gly Trp		
	2260	2265	2270
	Lys Cys Ile Pro Thr Ser Gly Asp Lys Thr Asp Thr Ser Glu Asn Gly		
35	2275	2280	2285
	Ala Pro Arg Arg Ala Arg Ser Ala His Gly Gly Lys Ser Asp Ser Glu		
	2290	2295	2300
	Lys Gly Ser Ile Cys Val Pro Pro Arg Arg Arg Arg Leu Tyr Ile Lys		
	2305	2310	2315
40	2320	2325	2330
	Lys Ile Val Asp Trp Ala Glu Ser Gln Ser Lys Thr Val Thr Ser Val		
	2335		
	Asn Gly Asp Gly Asn Gly Ser Gln Glu Val Val Ser Val Asn Gly Ala		
	2340	2345	2350
	Ser Glu Ser Gly Ser Gly Ser Gly Thr Glu Ser Gln Ala Ser Asp		
45	2355	2360	2365
	Val Ser Gln Gly Asn Gly Ala Ser Thr Ser Pro Gln Val Ala Leu Leu		
	2370	2375	2380
	His Ala Phe Val Lys Ser Ala Ala Ile Glu Thr Phe Phe Ala Trp His		
	2385	2390	2395
50	2400	2405	2410
	Lys Tyr Lys Val Asp Lys Glu Ile Glu Glu Lys Glu Lys Gln Ala Ala		
	2415		
	Gln Asn His Leu Val Gln Arg Lys Thr Ser Glu Asn Pro Gln Lys Lys		
	2420	2425	2430
	Leu Glu Gly Gly Glu Ile Pro Glu Asp Phe Lys Arg Gln Met Phe Tyr		
55	2435	2440	2445
	Thr Leu Gly Asp Tyr Arg Asp Ile Leu Val Gly Asp Lys Thr Met Ile		
	2450	2455	2460
	Glu Ala Leu Glu Lys Ser Gly Asp Thr Lys Ile Glu Asp Ile Ser Glu		
	2465	2470	2475
			2480

Lys Ile Pro Lys Ile Leu Asp Gly Glu Asn Asn Lys Ala Ala Gly Gly
 2485 2490 2495
 Gly Pro Lys Gln Pro Asn Ser Gly Lys Thr Pro Gln Glu Trp Trp Lys
 2500 2505 2510
 5 Glu Asn Ala Lys His Ile Trp His Gly Met Ile Cys Ala Leu Thr Tyr
 2515 2520 2525
 Asn Thr Asp Ser Asn Gly Lys Asp Lys Lys Ile Gln Gln Val Lys Ala
 2530 2535 2540
 Thr Asp Asn Thr Asp Leu Phe Gln Lys Leu Lys Lys Asp Asn Asp Tyr
 10 2545 2550 2555 2560
 Glu Thr Val Ser Phe Gly Ala Ser Gly Thr Gly Ala Lys Ser Asn Asp
 2565 2570 2575
 Asp Thr Lys Leu Lys Asn Phe Val Val Arg Pro Thr Tyr Phe Arg Trp
 2580 2585 2590
 15 Leu Glu Glu Trp Gly Glu Glu Phe Cys Arg Lys Gln Lys His Lys Leu
 2595 2600 2605
 Tyr Ile Ile Lys Lys Asp Cys Arg Asp Asn Lys Phe Cys Ser Gly Asp
 2610 2615 2620
 Gly Leu Arg Cys Asp Glu Lys Val Pro Asp Lys Lys Asp Ile Phe Lys
 20 2625 2630 2635 2640
 His Phe Asp Cys Pro Ser Cys Ala Arg His Cys Arg Ser Tyr Arg Lys
 2645 2650 2655
 Trp Ile Glu Arg Lys Lys Thr Glu Tyr Glu Lys Gln Glu Ser Ala Tyr
 2660 2665 2670
 25 Ser Lys Gln Lys Ser Asn Tyr Val Asn Gly Ser Asn Gly Asp Gly Gly
 2675 2680 2685
 Asn Asn Asn Asp Lys Glu Phe Tyr Thr Lys Leu Glu Thr Cys Thr Lys
 2690 2695 2700
 Ala Thr Asn Phe Leu Glu Ser Leu Lys Gly Gln Cys Ile Gly Asn Asn
 30 2705 2710 2715 2720
 Asn Gly Gly Thr Asp Ile Lys Phe Ser Asn Thr Asn Ile Thr Phe Gly
 2725 2730 2735
 Ser Ala Glu Asp Cys Lys Pro Cys Ser Glu Phe Lys Val Asn Cys Glu
 2740 2745 2750
 35 Asn Gly Ser Cys Gly Ser Ala Lys Gln Lys Asp Cys Pro Asn Asn Thr
 2755 2760 2765
 Ile Thr Ser Gln Asn Ile Lys Gly Leu Thr Asp Gln Val Asp Met Arg
 2770 2775 2780
 Val Ser Asp Asn Thr Glu Ser Gly Phe Glu Gly Asp Leu Gly Ile Cys
 40 2785 2790 2795 2800
 Gln Gly Ala Gly Ile Phe Lys Gly Ile Arg Lys Asp Glu Trp Lys Cys
 2805 2810 2815
 Gly Asp Phe Cys Gly Ile Asp Ile Cys Thr Leu Glu Lys Thr Asn Asn
 2820 2825 2830
 45 Gly Lys Glu Ser Asp Lys Lys Tyr Ile Ile Met Lys Glu Phe Val Lys
 2835 2840 2845
 Arg Trp Leu Glu Tyr Phe Phe Glu Asp Tyr Asn Arg Ile Gln Lys Lys
 2850 2855 2860
 Leu Lys Thr Cys Lys Glu Asn Gly Lys Gly Ser Thr Cys Ile Arg Ser
 50 2865 2870 2875 2880
 Cys Val Asp Glu Trp Ile Lys Leu Lys Lys Asp Glu Trp Gln Lys Ile
 2885 2890 2895
 Asn Ser Asn Tyr Leu Asp Gln Asn Thr Lys Glu Asn Pro Glu Gly Asn
 2900 2905 2910
 55 Asn Leu Ser Ser Phe Leu Glu Asp Gly Pro Phe Lys Asn Glu Val Asp
 2915 2920 2925
 Lys Ala Ile Lys Pro Cys Gly Asn Leu Thr Asp Phe Lys Lys Ser Lys
 2930 2935 2940
 Lys Cys Asn Gly Thr Ser Arg Ser Gly Asn Ser Glu Glu Ser Thr Lys

2945	2950	2955	2960
Tyr Asp Gly Val Ile Cys Leu Leu Asp Asn Leu Lys Asn Ile Ile Lys			
2965	2970	2975	
Thr Cys Gln Asn Val Pro Ser Gly Lys Pro Asp Thr Pro Cys Gln Lys			
5 2980	2985	2990	
Ser Pro Ala Pro Val Gly Asp Asp Asp Pro Leu Glu Glu Glu Asn			
2995	3000	3005	
Pro Val Thr Gln Pro Asn Ile Cys Pro Gln Thr Ser Val Glu Glu Lys			
3010	3015	3020	
10 Lys Lys Glu Glu Glu Lys Cys Asp Glu Lys Glu Glu Glu Glu			
3025	3030	3035	3040
Lys Glu Glu Glu Lys Asp Lys Gly Asp Glu Glu Val Lys Glu Glu Glu			
3045	3050	3055	
Lys Asp Lys Gly Asp Glu Glu Glu Ala Glu Glu Glu Glu Glu Glu			
15 3060	3065	3070	
Glu Glu Glu Thr Asp Ser His Ile Tyr Glu Asp Tyr Ser Asp Ser Asp			
3075	3080	3085	
Ala Glu Glu Asp Asp Glu Asp Glu Ala Val Thr Glu Ser Leu Ser Pro			
3090	3095	3100	
20 Ser Glu Ser Gln Pro Lys Arg Leu Leu Arg Glu Phe Pro Ser Pro Glu			
3105	3110	3115	3120
Leu Lys Asn Ala Met Leu Phe Ser Thr Ile Leu Trp Met Val Gly Ile			
3125	3130	3135	
Gly Phe Ala Ala Phe Thr Tyr Phe Leu Lys Lys Lys Pro Lys Ser			
25 3140	3145	3150	
Pro Val Asp Leu Leu Arg Val Leu Asp Ile His Lys Gly Asp Tyr Gly			
3155	3160	3165	
Thr Pro Thr Pro Lys Ser Lys Asn Arg Tyr Ile Pro Tyr Val Ser Asp			
3170	3175	3180	
30 Thr Tyr Lys Gly Lys Thr Tyr Leu Tyr Val Glu Gly Asp Thr Asp Glu			
3185	3190	3195	3200
Glu Lys Tyr Met Phe Leu Ser Asp Thr Thr Asp Ile Thr Ser Ser Glu			
3205	3210	3215	
Ser Glu Tyr Glu Glu Leu Asp Ile Asn Asp Ile Tyr Val Pro Gly Ser			
35 3220	3225	3230	
Pro Lys Tyr Lys Thr Leu Ile Glu Val Val Leu Glu Pro Ser Lys Ser			
3235	3240	3245	
Asp Gly Asn Thr Pro Gly Lys Gly Asp Gly Asn Thr Leu Gly Asp Asp			
3250	3255	3260	
40 Met Val Pro Thr Thr Asn Thr Phe Thr Asp Glu Glu Trp Asn Glu Leu			
3265	3270	3275	3280
Lys Gln Asp Phe Val Ser Gln Tyr Ile Gln Ser Arg Leu Pro Met Asp			
3285	3290	3295	
Val Pro Gln Tyr Asp Val Ser Thr Glu Ser Pro Met Asn Ile Gly Gly			
45 3300	3305	3310	
Asn Val Leu Asp Asp Gly Met Asp Glu Lys Pro Phe Ile Thr Ser Ile			
3315	3320	3325	
His Asp Arg Asp Leu Asn Ser Gly Glu Glu Ile Ser Tyr Asn Ile His			
3330	3335	3340	
50 Met Ser Thr Asn Thr Asn Asn Asp Ile Pro Lys Tyr Val Ser Asn Asn			
3345	3350	3355	3360
Val Tyr Ser Gly Ile Asp Leu Ile Asn Asp Thr Leu Ser Asp Asn Lys			
3365	3370	3375	
His Ile Asp Ile Tyr Asp Glu Val Leu Lys Arg Lys Glu Asn Glu Leu			
55 3380	3385	3390	
Phe Gly Thr Asn Tyr Lys Lys Asn Thr Ser Asn Asn Ser Val Ala Lys			
3395	3400	3405	
Asn Thr Asn Ser Asp Pro Ile Met Asn Gln Leu Asp Leu Leu His Lys			
3410	3415	3420	

Trp Leu Asp Arg His Arg Asp Ile Cys Glu Asn Trp Gly Lys Lys Glu
 3425 3430 3435 3440
 Asp Ile Leu Asn Lys Leu Asn Glu Gln Trp Asn Lys Asp Asn Asp Gly
 3445 3450 3455
 5 Gly Asp Ile Pro Asn Asp Asn Lys Lys Leu Asn Thr Asp Val Ser Ile
 3460 3465 3470
 Gln Ile Asp Met Asp Glu Thr Lys Gly Lys Lys Glu Phe Ser Asn Met
 3475 3480 3485
 Asp Thr Ile Leu Asp Asp Met Glu Asp Asp Ile Tyr Tyr Asp Val Asn
 10 3490 3495 3500
 Asp Glu Asn Pro Ser Val Asp Asp Ile Pro Met Asp His Asn Lys Val
 3505 3510 3515 3520
 Asp Val Pro Lys Lys Val His Val Glu Met Lys Ile Leu Asn Asn Thr
 3525 3530 3535
 15 Ser Asn Gly Ser Leu Glu Gln Gln Phe Pro Ile Ser Asp Val Trp Asn
 3540 3545 3550
 Ile

 20
 <210> 3
 <211> 8985
 <212> DNA
 <213> Plasmodium falciparum

 25
 <220>
 <221> gene
 <222> (0)...(0)
 <223> PF11_0008

 30
 <400> 3
 atggggtcac aaacatcaaa attttctaaa actgttggtg gaaatgaaac acacaacagt 60
 gcccgaaatg ttttgaagg ttttgcaaaa gatataaaaa gggatgtatc aaataacgca 120
 aaaagacatg gaaaagttt gaaggaaat ttgagagat ccaaattttt tcattgattat 180
 35 tctaaagttaa gagacatacc tagaagtccc tgtgatctt attttgggt tcatacgaat 240
 gttggaggg acaaagcata tgaaagagat ccttggatc gcagacaagc aaaaaataat 300
 tacaatttgg aaggagcagt atgtacgaat agtaaaataa aaggtaatga aaacaagata 360
 aatgacattg gagcgtgtgc cccatataga agacgaaata tatgcgatta taatttagaa 420
 catctaaatg aaagaaatgt tttaataact catgatttt tgggaaatgt gtttagttat 480

 40 gcaaaacgtg aaggtaatc tattgttgag aaacatccaa atagaggatc ttcagaagata 540
 tgtattgccc ttgcaagaag ttttgcagat ataggagata tttaagagg aaaagacatg 600
 tatgtcggt atgataaaaa agaaaaaaat cgaagaaaac aattagaaaa taagttgaaa 660
 gatattttcg ataatatata taaggatttg acgaaagaaga aggggaggaa tgggagaag 720
 tcggcgctac aagaacgcta caatgatcct aaaggagatt ttttcaatt acgagaagat 780

 45 tggtggcgc ttaatagaga agacgtatgg aaagcattaa catgttctgc ggatgacagt 840
 gaagattatt tcatacaatc agaagggttt acaaaatcat ttacaaatcc taaatgtggc 900
 catggtgaca atgaggttc tacaatctt gattatgtcc ctcaattttt acgttggttc 960
 accgaatggg cagaagagtt ttgttagata agaaaaattt aatttagggaa gttaaaaac 1020
 gaatgtcgtg gtgagacatc aggtaaaagg tattgttagt gcgatggta tgattgtact 1080

 50 aaaacagata tatcacgtaa tattttttt atggatttag attgcccacg ttgtgaagaa 1140
 gaatgttagaa aatatgatga atggattgaa aataaagaaa atgaattaga taaacaaaaa 1200
 aataaaataca ctaaaagaaaat tgaaaaattt aaagataatt ctaagagcaa ttatgataaa 1260
 aattttttttaa taacacttac taaaaaatat ggttcaattt acttattttt agatacatta 1320
 aaagaaggat cacattgttag ctacaatacc atagaagata aaatagattt taacaaagca 1380

 55 aatcaaacat ttactagttc gaaattttgt gggcatgtc ctttttatgg agttaaatgc 1440
 aattggaaaaa catgtacaga ggttaaggaa aatgagtaca aaaaaaaaaa taaggttgat 1500
 agtacacata cgacagaaca acctactgtt attgatgtac tagttactca tattagagga 1560
 acaaataattc ccgaagattt aaaggattgt aaaaaatatg gtcttttaa aggtatgcga 1620
 aaacaqcgtt qgaaatgtca atatataaat ccatatgtq aatqcaagtt gagtcccttt 1680

gtgaaagata tagatgttga tgatcgtatt ttattnaaag tattgttga gcgttggta 1740
 aaatattca tacaagatt taataatgtt aaggacaaaa ttaatagatg tacaaaattc 1800
 gaaaaggaa aagataatac atgtattaaa gttgttaac ataaaatgcga atgtgtggaa 1860
 aaatggataa aaataaaggaa agcagaatgg aaaaaataa atcaacatta taaccaacaa 1920
 5 aaaaaacatt atacctatac tgttcctcg tgggttaata gttatttgac gcaccacac 1980
 ttctctatgt attttattaa tgcatttagaa gttttaaa atatacgggg attagaaaat 2040
 ttgaaggaat gtagtagtga cacttgtaa attgaaaaaa tttagaactat agatgatgat 2100
 ttaataaaaag aattaatttc taaactttaa gataaatgtg ctatgttga aaaccaacat 2160
 aaagcaacca aaggtaaaga atgtgttgtt aaattacca aactctaaa ttagtcaagat 2220
 10 gatgaagaag acgaagaata cgaagcacca ccaccacca cacccctcg cacccaaaa 2280
 aaccctcg ttaatgtca aaaccagaag gttcgtaaaa tcaggagcgt gagacagatg 2340
 ccgaaaagga tgcaaaaaca agcaagtgtt cgtgttcctc gtgctcggca gggagggag 2400
 agggagcagg ttgttaaagaa cggcgccag gaccaccacc tccagcgggt gctttgggt 2460
 ggggaggcgg aggcgggagga gccggagacg gcccggggaa agaaggagga ggaaaaggag 2520
 15 gaagacacgg acgggaaggt acagccacca ccagcagcaa caacaccgg ggtgaagccg 2580
 ccatgtgaca tagttaaaaa acactttaa gataagcacg ataatactgg tgcaatagat 2640
 cattgtatc caaaaaagga ttatcctcca tggaaaaacg acaaaagttt agtggatgaa 2700
 gatgggtgtt atatgcctcc tagaagacaa aaattatgtg taattaattt agaacattt 2760
 aaagagaata catcagatga tttgagagaa gcattcatta aatgcgtgc cgcagaaact 2820
 20 tatttttat ggcaaaaata taaagaggat aacaatggtg gtgaagatct acaaaaccaa 2880
 taaaaaagtg gaaaaattcc tgaagatttt aaacgtcaaa tgggtctacac atttggagat 2940
 tatagagatt tcttatttgg aacagatata tcaaaaattaa ataaacatac agaagctgtt 3000
 aaaactaata tagatagaat tttcccacca actgagcgaa caaatgatac aatacgtaaa 3060
 gaattttggg aaaaaaacgc agaatctatt tggcaaggaa tggatgtgc ttttaagttt 3120
 25 aatagtaatg aaaaaaaaaat ggatccagat gtacaaaaaag aactaaactc cacctacaac 3180
 tacgatacca taaaaataa tctagaagac tttgcgaaca gacctaatt cttacgatgg 3240
 tttattgaat ggagtgtatg attttgcgtt gaacggaaaga agaaggaaga aaaggtagga 3300
 tcagctgtt agaatgatca tgaggatgt gcaaaacacta aggataatgg taatgttaat 3360
 tgtgttaacg catgtatgc atataaaaaaa tacattacag acaaaaaaaga acaatatgaa 3420
 30 aaacaagcaa agaaatttga tattgataaa agtcagaata aaccaggata tgaagattat 3480
 tctggcaaaa aggctctga atatttggaa gaaaaatgtt taaactcatc atgtgattat 3540
 atgctaaaat taaaagataa ttccaaattac tggaaaaaac ctcatacaac atacgacgat 3600
 aattcacttc aaaacaaatg tagtgcctt ctttctccct gcaaatcgt ggataaaaca 3660
 ctggcgaca aaacctcaaa gtcttacgccc gaagggtgca aatggaaata tgggaagatg 3720
 35 ccactagtt tggatgggt atgtatgac aaagaggggtg agaagggtaa ggaggacggt 3780
 ttatgtatc cgccaaggag aaagagatca tattgtttttt ctgctgtt aactttttt 3900
 cacacaacag taggtctccg agaagctttt agagagtata aagaagaaaa acaaagaaat 3960
 gcttggcatg aatttacaaa gaaaaaagaa ggagaacttg gatttatcga ccaatccaa 4020
 40 aacaaaataa gaaaaatgg agaaatacat gaagagttt aagtcaaat gttctatacc 4080
 cttgcagatt atagagatatttattttggg aataatatac gtattggtaa cgacatgggg 4140
 aaagttaaaa gtaatataca taagttttc gcaaatatgtt gtggcaaaac acctactgccc 4200
 aaaaaaacaac caccaaaaga atggggaa aaaaatgcaaa aagatataatg ggaagaatg 4260
 ttatgtgctt taagttatga tacaaaaaca aaaattaaga atgaagaact gcgcaagaaa 4320
 45 cttatagatc caaagaacac caactacatg tacaaaaaag ttacattttag tagtataat 4380
 aacacaaaatt tgcggaaaatt tacagaaaga cccccgtttt ttcgatgggt tcaggaatgg 4440
 ggagaagagt tttgtcgaaa aaaaaataa aaaattgtata aaattgaaaa agaatgtcg 4500
 ggaccatatg gtcgaaatca ttgtgtatggc gatggattcg actgtatgtt aataggccca 4560
 aatgagaatg gaagttttgc gattttaaa tggccatgtt gtccatgtt tcgtcgatct 4620
 50 tataaaacgt ggataaacac aaaaaaagac gaattttaaa aacaagaaaa actatataat 4680
 aaagaaaattttaa aggataataa aagtaattat gataatatac atgataaaga atttggtaaa 4740
 aacctttgtt cagattataa gtctgttgc tcattttaa aaaagttaaa agaaggccca 4800
 tgggtgttaca aaaatactaa agacagtaaa atagatttttta aggatacaga ggagacattt 4860
 agaaacgctg aatattgcga tccatgtcct gtattttggag ttattttgtt aacgtgtat 4920
 55 tgcgtatatttctacagaaaaa gaagtgtat gcacaagaat ttaaggatc atatgatgt 4980
 aaaaataagg aaaacccctaa taaagaagta aatatgcgtt tcgtatgtt aacagcaaaag 5040
 aaatacccg gtgattttaa cgggtttgc gaaaattcaa gtatcttga aggtattttaga 5100
 gaagataaat ggtcatgtgg ttattttgtt ggttttagata tatgtacacc caacaaaact 5160
 acaggtata tacatgataa acaaaatgcac ccaatttagag tactgtttaa acgttggata 5220

5	gaaaatttt	taaaagatca	taacaaaatt	aaagacaaaa	tttctttatg	tataaataa	5280	
	gaaaacagaa	atatatgtac	agatgttgc	agaaaaaatt	gtgaatgtat	agataaattgg	5340	
	atagagatga	aatgaaaaga	atggaaaata	gtacgcgatc	gttacgtcaa	acaatataat	5400	
	gttgctgatt	cagtagttt	cgaagtgaga	agattttag	agggcttgca	acctcaaaat	5460	
10	gacccgtaaa	aagttaaagg	agatgttaat	gattacgtg	atttagagga	actaagtgaa	5520	
	tgtactaata	ctgtatcaac	agaaaaataga	aatgttagaa	aaaaggatgt	atagaaaagt	5580	
	ttgtttaata	aactaaaaa	tgaaaatacgt	cattgtaaaa	atgaacgtga	cgtatgtatg	5640	
	ggcaaggaaa	gttgcaaaac	attacccgaa	cctacagacg	atccacaaac	agatagtgtat	5700	
15	accacgaca	cacctgacat	accaccagg	gacgttgcac	ccacttttg	taatgttcca	5760	
	gcaaatccat	gtggcgacaa	aagcgccacc	aatgtggtaa	atgtgacaga	ggggcgaag	5820	
	gaaatgcacg	aaggaggaca	caaggatatg	ttagagagga	gtgtaaaaaa	ggttgagagt	5880	
	aaggtaagg	atagtacgg	tgagagtgt	ttaagggctg	atgcataaaa	aggtgaatat	5940	
20	aaacatgaag	gtaatccaga	tgacttgaaa	cacaacatgt	gcaatataac	gaaggaacat	6000	
	accaattatc	aaaaacgtgg	tggttataat	tatcgaggac	catgtacggg	taaaggtat	6060	
	ggtaaaagaca	caagatttg	cataggaacc	atatggaaag	atgaagacga	aaaagatgaa	6120	
	accattaaag	ttctgttgc	tccgcgacgt	cgtcatatgt	gtacatcaaa	ttttagaat	6180	
25	ttacttcatg	ttaataaggg	cccacttcta	aaagttgaac	ctgataaaaat	taatcattcc	6240	
	tttttggggg	atgttttgc	tgcagcaaaa	tatgaagcag	aattcataaa	aaccaattat	6300	
	acgagattaa	atggccaaaa	tgacaatgga	gctaaatgt	gagctatgaa	atatagttt	6360	
	gctgatata	gtgatattat	acgaggaaaa	gatctgtggg	gaattcagga	cttcaaggat	6420	
30	ctacaaacta	agttagtaac	aatattttgt	aaaattaaag	aggaaattcc	cgtatataaa	6480	
	aaaaaatata	gtagtaaaaa	tcccccatat	acgacattac	gtgaacattg	gtgggaagca	6540	
	aatcgagcca	aagtatggg	agcaatgca	tgtccaacaa	taccaccgt	caccacaagt	6600	
	tgtgatacta	ccactgttac	ccctcttgc	gattacatcc	cacaagatt	acgttggatg	6660	
35	accgaatggg	ccgaatgggt	ctgcaaaatg	cagtcacagg	agtatgaggt	gttagtgaaa	6720	
	cagtgttagg	attgttagg	tggaaatatgt	gagaatggta	aggatgactg	tgtcaagtgc	6780	
	acacaagctt	gtaatacata	taaacaaaaaa	ataaaaaaaat	ggttggatca	atggaaaggaa	6840	
	atatcaaaaa	aatacaaaac	attataccaa	caagcaaaag	gcagtgtaa	tgtgtctact	6900	
40	actagtagta	ctacagatga	gaaagacaaa	gatgtcggt	atttcttgaa	aatgttacac	6960	
	30	caaaaaaaaata	ctgataatac	cataataact	actgctgcag	gatttataca	tcaagaagca	7020
	catatgactg	attgtcaaaa	acaaacaaatt	ttttgtaaaa	acactagtt	taacgacaag	7080	
	aagaaatatg	cttttgc	tccaccacat	gatcatgtat	atgcgtgtc	ttgcaggcc	7140	
	ccatcaacgc	cagtagacgt	ctcccgcaaa	ctagacaccc	aacgtgaccc	caaaaaagag	7200	
45	gaatctgaac	ctgaatccga	agaagaagaa	gacgatgccc	aagaggagga	ggagccggca	7260	
	aaggagacgg	ctaccacaga	gacaacacaa	ccagcagcac	cagcgggacc	accggtacaca	7320	
	ccagtaccag	aactaccggg	accacccgca	ccagcgggac	cagcagctga	tggccccatt	7380	
	gaggatgacg	aagacgccc	aaacgaagac	gatgtgacg	tcggctccgc	caccggcaca	7440	
	gaagacgatg	acgacgacga	agatgacgac	gacgaagacg	aagaggactc	agcagacgaa	7500	
50	ggttgaagggt	aaggcgacgg	cggtgacgtc	ggcgaggagg	aagatgaaga	tcacggccggc	7560	
	caggaggccg	aggggggtgt	accacaacca	gcagcaccac	aaccaccaac	cccacaaactc	7620	
	ttggatgacc	ccctccttaa	aaccggccctc	atgtttctta	ccatcctctg	gatggtaggt	7680	
	atcggttttgc	cggcgttgc	ttacttttta	ctcaagaaaa	aatccaaatc	ttctgttgc	7740	
	ttgttgcgtg	tactgaatat	cccggaaagg	gattatgaaa	tgcctacgtt	gaatccaaa	7800	
55	aataggtaca	taccatata	aaagtggttca	tataaaggca	aaacatataat	atatatggaa	7860	
	ggagatagtg	atagtggaca	ctactacgaa	gatacaactg	atattacttc	atccgaaagt	7920	
	gaatatgaag	aattggatat	taatgagata	tatccgtatc	agtcacaaa	atacaaaca	7980	
	ttgatttgaag	tggtactaga	accatccaa	agtaatggta	acacaccaag	taagggtgtat	8040	
	ggtaacacac	taggtgatga	tatggtac	accacgaata	catttacaga	tgaggaatgg	8100	
	agtgaatttga	aacatgattt	tatatcaca	tatatacaaa	gtgaaccact	ggatgtacca	8160	
	aaagttgggt	tatcaaagga	attaccaatg	aatataggag	gtaatgtttt	agatgtgtt	8220	
	ataaaacgaaa	aacctttat	tacttctatt	catgataggg	atttatatac	tgggaaagaa	8280	
	ataaaatata	atattaat	gggtactaat	agtatggacg	atccaacata	tgtatcaa	8340	
	aatgttatatt	ctggtatcga	ttaattaaat	gacacattaa	gtggtaatca	acatattgtat	8400	
	atatatgtat	aagtgtaaa	aagaaaagaa	aatgaattat	ttggaaacaaa	ttataagaaa	8460	
55	aatacatcaa	ataacaatgt	agctaaat	acaatagt	atcctattat	gaaccaatta	8520	
	gatttggttac	atacatgggt	agatagacat	agagatatgt	gtgagaagtg	gaataaaaaag	8580	
	gaagaatttgt	tagataaatt	aatgaacaa	tggaaataag	ataatgatgg	tggatata	8640	
	ccaaatgtata	acaaaaagtt	gaatacggat	gtttctatac	aaatagatat	agatgaaaat	8700	
	aaaggaaaga	aagaattttaq	taatatqgt	acaacqgtq	atacacctac	tatqgataq	8760	

atattggatg atttggaaac atataatgaa cctttttatg atatatttga ggatgatgtg 8820
 tattatgatg tataatgatga aaaccattt gtggatgata tacctatgga tcataataaa 8880
 gtagatgtac ctaagaaagt acatattgaa atgaaaatcc ttaataatac atccaatgga 8940
 tcgttggAAC aacaatttcc tatatcgat gtatggata tataa 8985

5

<210> 4
 <211> 2994

10 <212> PRT

<213> Plasmodium falciparum

<400> 4
 Met Gly Ser Gln Thr Ser Lys Phe Ser Lys Thr Val Val Gly Asn Glu
 15 1 5 10 15
 Thr His Asn Ser Ala Arg Asn Val Leu Glu Gly Phe Ala Lys Asp Ile
 20 25 30
 Lys Arg Asp Val Ser Asn Asn Ala Lys Arg His Gly Lys Val Leu Lys
 35 40 45
 20 Gly Asn Leu Arg Asp Ala Lys Phe Tyr His Asp Tyr Ser Lys Leu Arg
 50 55 60
 Asp Ile Pro Arg Ser Pro Cys Asp Leu Asp Phe Trp Phe His Thr Asn
 65 70 75 80
 Val Trp Arg Asp Lys Ala Tyr Glu Arg Asp Pro Cys Tyr Gly Arg Gln
 25 85 90 95
 Ala Lys Asn Asn Tyr Asn Leu Glu Gly Ala Val Cys Thr Asn Ser Lys
 100 105 110
 Ile Lys Gly Asn Glu Asn Lys Ile Asn Asp Ile Gly Ala Cys Ala Pro
 115 120 125
 30 Tyr Arg Arg Arg Asn Ile Cys Asp Tyr Asn Leu Glu His Leu Asn Glu
 130 135 140
 Arg Asn Val Leu Asn Thr His Asp Leu Leu Gly Asn Val Leu Val Met
 145 150 155 160
 Ala Lys Arg Glu Gly Glu Ser Ile Val Glu Lys His Pro Asn Arg Gly
 35 165 170 175
 Ser Ser Glu Val Cys Ile Ala Leu Ala Arg Ser Phe Ala Asp Ile Gly
 180 185 190
 Asp Ile Leu Arg Gly Lys Asp Met Tyr Val Gly Tyr Asp Glu Lys Glu
 195 200 205
 40 Lys Asn Arg Arg Lys Gln Leu Glu Asn Lys Leu Lys Asp Ile Phe Asp
 210 215 220
 Asn Ile Tyr Lys Asp Leu Thr Lys Lys Gly Arg Asn Gly Lys Lys
 225 230 235 240
 Ser Ala Leu Gln Glu Arg Tyr Asn Asp Pro Lys Gly Asp Phe Phe Gln
 45 245 250 255
 Leu Arg Glu Asp Trp Trp Ala Leu Asn Arg Glu Asp Val Trp Lys Ala
 260 265 270
 Leu Thr Cys Ser Ala Asp Asp Ser Glu Asp Tyr Phe Ile Gln Ser Glu
 275 280 285
 50 Gly Val Thr Lys Ser Phe Thr Asn Pro Lys Cys Gly His Gly Asp Asn
 290 295 300
 Glu Val Leu Thr Asn Leu Asp Tyr Val Pro Gln Phe Leu Arg Trp Phe
 305 310 315 320
 Thr Glu Trp Ala Glu Glu Phe Cys Arg Ile Arg Lys Ile Lys Leu Gly
 55 325 330 335
 Lys Val Lys Asn Glu Cys Arg Gly Glu Thr Ser Gly Lys Arg Tyr Cys
 340 345 350
 Ser Gly Asp Gly Tyr Asp Cys Thr Lys Thr Asp Ile Ser Arg Asn Ile
 355 360 365

Phe Tyr Met Asp Leu Asp Cys Pro Arg Cys Glu Glu Glu Cys Arg Lys
 370 375 380
 Tyr Asp Glu Trp Ile Glu Asn Lys Glu Asn Glu Leu Asp Lys Gln Lys
 385 390 395 400
 5 Asn Lys Tyr Thr Lys Glu Ile Glu Lys Leu Lys Asp Asn Ser Lys Ser
 405 410 415
 Asn Tyr Asp Lys Asn Phe Tyr Leu Thr Leu Thr Lys Lys Tyr Gly Ser
 420 425 430
 Ile Asn Leu Phe Leu Asp Thr Leu Lys Glu Gly Ser His Cys Ser Tyr
 10 435 440 445
 Asn Thr Ile Glu Asp Lys Ile Asp Phe Asn Lys Ala Asn Gln Thr Phe
 450 455 460
 Thr Ser Ser Lys Phe Cys Gly Ala Cys Pro Phe Tyr Gly Val Lys Cys
 465 470 475 480
 15 Asn Trp Lys Thr Cys Thr Glu Val Lys Glu Asn Glu Tyr Lys Lys
 485 490 495
 Asn Lys Val Asp Ser Thr His Thr Thr Glu Gln Pro Thr Ala Ile Asp
 500 505 510
 Val Leu Val Thr His Ile Arg Gly Thr Asn Ile Pro Glu Asp Leu Lys
 20 515 520 525
 Asp Cys Lys Lys Tyr Gly Leu Phe Lys Gly Met Arg Lys Gln Ala Trp
 530 535 540
 Lys Cys Gln Tyr Ile Asn Pro Tyr Asp Glu Cys Lys Leu Ser Pro Phe
 545 550 555 560
 25 Val Lys Asp Ile Asp Val Asp Asp Arg Ile Leu Phe Lys Val Leu Phe
 565 570 575
 Glu Arg Trp Leu Lys Tyr Phe Ile Gln Asp Phe Asn Asn Val Lys Asp
 580 585 590
 Lys Ile Asn Arg Cys Thr Lys Phe Glu Lys Gly Lys Asp Asn Thr Cys
 30 595 600 605
 Ile Lys Gly Cys Lys His Lys Cys Glu Cys Val Glu Lys Trp Ile Lys
 610 615 620
 Ile Lys Glu Ala Glu Trp Lys Lys Ile Asn Gln His Tyr Asn Gln Gln
 625 630 635 640
 35 Lys Lys His Tyr Thr Tyr Ser Val Pro Arg Trp Val Asn Ser Tyr Leu
 645 650 655
 Thr His Gln His Phe Ser Ser Asp Phe Ile Asn Ala Leu Glu Ala Phe
 660 665 670
 Lys Asn Ile Arg Gly Leu Glu Asn Leu Lys Glu Cys Ser Ser Asp Thr
 40 675 680 685
 Cys Lys Ile Glu Lys Ile Arg Thr Ile Asp Asp Asp Leu Ile Lys Glu
 690 695 700
 Leu Ile Ser Lys Leu Lys Asp Lys Cys Ala Met Cys Lys Asn Gln His
 705 710 715 720
 45 Lys Ala Thr Lys Gly Lys Glu Cys Cys Gly Lys Leu Pro Lys Thr Leu
 725 730 735
 Asn Asp Gln Asp Asp Glu Glu Asp Glu Glu Tyr Glu Ala Pro Pro Pro
 740 745 750
 Pro Thr Pro Pro Arg Thr Gln Lys Asn Pro Cys Val Asn Gly Gln Asn
 50 755 760 765
 Gln Lys Val Arg Lys Ile Arg Ser Val Arg Arg Val Pro Lys Arg Met
 770 775 780
 Gln Lys Gln Ala Ser Val Arg Val Pro Arg Ala Arg Gln Gly Gly Glu
 785 790 795 800
 55 Arg Glu Gln Val Val Lys Asn Gly Arg Gln Asp His His Leu Gln Arg
 805 810 815
 Val Leu Leu Val Gly Glu Ala Glu Ala Glu Glu Pro Glu Thr Ala Glu
 820 825 830
 Glu Lys Lys Glu Glu Lys Glu Asp Thr Asp Gly Lys Val Gln

835	840	845
Pro Pro Pro Ala Ala Thr Thr Pro Gly Val Lys Pro Pro Cys Asp Ile		
850	855	860
Val Glu Lys His Phe Lys Asp Lys His Asp Asn Thr Gly Ala Ile Asp		
5 865	870	875
His Cys Asn Pro Lys Lys Asp Tyr Pro Pro Trp Lys Asn Asp Lys Ser		
885	890	895
Leu Val Asp Glu Asp Gly Val Tyr Met Pro Pro Arg Arg Gln Lys Leu		
900	905	910
10 Cys Val Ile Asn Leu Glu His Phe Lys Glu Asn Thr Ser Asp Asp Leu		
915	920	925
Arg Glu Ala Phe Ile Lys Cys Ala Ala Ala Glu Thr Tyr Leu Leu Trp		
930	935	940
15 Gln Lys Tyr Lys Glu Asp Asn Asn Gly Gly Glu Asp Leu Gln Asn Gln		
945	950	955
Leu Lys Ser Gly Lys Ile Pro Glu Asp Phe Lys Arg Gln Met Phe Tyr		
965	970	975
Thr Phe Gly Asp Tyr Arg Asp Phe Leu Phe Gly Thr Asp Ile Ser Lys		
980	985	990
20 Leu Asn Lys His Thr Glu Ala Val Lys Thr Asn Ile Asp Arg Ile Phe		
995	1000	1005
Pro Pro Thr Glu Arg Thr Asn Asp Thr Ile Arg Lys Glu Phe Trp Glu		
1010	1015	1020
Lys Asn Ala Glu Ser Ile Trp Gln Gly Met Leu Cys Ala Leu Ser Tyr		
25 1025	1030	1035
Asn Ser Asn Asp Lys Lys Met Asp Pro Asp Val Gln Lys Glu Leu Asn		
1045	1050	1055
Ser Thr Tyr Asn Tyr Asp Thr Ile Lys Asn Asn Leu Glu Asp Phe Ala		
1060	1065	1070
30 Asn Arg Pro Gln Phe Leu Arg Trp Phe Ile Glu Trp Ser Asp Glu Phe		
1075	1080	1085
Cys Arg Glu Arg Lys Lys Glu Glu Lys Val Gly Ser Ala Cys Lys		
1090	1095	1100
Asn Asp Tyr Glu Gly Cys Ala Asn Thr Lys Asp Asn Gly Asn Gly Asn		
35 1105	1110	1115
Cys Val Asn Ala Cys Asn Ala Tyr Lys Tyr Ile Thr Asp Lys Lys		
1125	1130	1135
Glu Gln Tyr Glu Lys Gln Ala Lys Lys Phe Asp Ile Asp Lys Ser Gln		
1140	1145	1150
40 Asn Lys Pro Gly Tyr Glu Asp Tyr Ser Gly Lys Lys Ala Ser Glu Tyr		
1155	1160	1165
Leu Lys Glu Lys Cys Ile Asn Ser Ser Cys Asp Tyr Met Leu Lys Leu		
1170	1175	1180
Lys Asp Asn Ser Asn Tyr Trp Glu Lys Pro His Thr Thr Tyr Asp Asp		
45 1185	1190	1195
Asn Ser Leu Gln Asn Lys Cys Ser Cys Pro Leu Ser Pro Cys Glu Ile		
1205	1210	1215
Val Asp Lys Thr Leu Gly Asp Lys Thr Ser Lys Ser Tyr Ala Glu Gly		
1220	1225	1230
50 Cys Lys Trp Lys Tyr Gly Lys Met Pro Leu Gly Leu Gly Trp Leu Cys		
1235	1240	1245
Asn Asp Lys Glu Gly Glu Lys Gly Lys Glu Asp Gly Leu Cys Ile Pro		
1250	1255	1260
Pro Arg Arg Lys Arg Leu Tyr Val Lys Asp Leu Glu Thr Phe Ser Asp		
55 1265	1270	1275
His Thr Thr Val Gly Leu Arg Glu Ala Phe Ile Lys Cys Ala Ala Val		
1285	1290	1295
Glu Thr Phe Phe Ala Trp His Glu Phe Thr Lys Glu Lys Glu Arg Glu		
1300	1305	1310

Tyr Lys Glu Glu Lys Gln Arg Asn Gly Glu Leu Gly Phe Ile Asp Glu
 1315 1320 1325
 Asn Asp Gln Ile Pro Lys Asp Pro Asp Asn Pro Gln Asn Lys Ile Arg
 1330 1335 1340
 5 Lys Asn Gly Glu Ile His Glu Glu Phe Lys Ser Gln Met Phe Tyr Thr
 1345 1350 1355 1360
 Leu Ala Asp Tyr Arg Asp Ile Leu Phe Gly Asn Asn Ile Gly Ile Gly
 1365 1370 1375
 Asn Asp Met Gly Lys Val Lys Ser Asn Ile Asp Lys Val Phe Ala Asn
 10 1380 1385 1390
 Ser Ser Gly Lys Thr Pro Thr Ala Lys Lys Thr Thr Pro Lys Glu Trp
 1395 1400 1405
 Trp Glu Lys Asn Ala Lys Asp Ile Trp Glu Gly Met Leu Cys Ala Leu
 1410 1415 1420
 15 Ser Tyr Asp Thr Lys Thr Lys Ile Lys Asn Glu Glu Leu Arg Lys Lys
 1425 1430 1435 1440
 Leu Ile Asp Pro Lys Asn Ser Asn Tyr Met Tyr Glu Lys Val Thr Phe
 1445 1450 1455
 Ser Ser Asp Asn Asn Thr Asn Leu Ser Lys Phe Thr Glu Arg Pro Pro
 20 1460 1465 1470
 Phe Phe Arg Trp Phe Gln Glu Trp Gly Glu Glu Phe Cys Arg Lys Lys
 1475 1480 1485
 Lys Ile Lys Ile Asp Lys Ile Glu Lys Glu Cys Arg Gly Pro Tyr Gly
 1490 1495 1500
 25 Arg Asn His Cys Asp Gly Asp Gly Phe Asp Cys Ser Glu Ile Gly Pro
 1505 1510 1515 1520
 Asn Glu Asn Gly Ser Phe Ala Ile Phe Lys Cys Pro Ser Cys Ala Ile
 1525 1530 1535
 Ser Cys Arg Ser Tyr Lys Thr Trp Ile Asn Thr Lys Lys Asp Glu Phe
 30 1540 1545 1550
 Lys Lys Gln Glu Lys Leu Tyr Asn Lys Glu Ile Lys Asp Asn Lys Ser
 1555 1560 1565
 Asn Tyr Asp Asn Ile Tyr Asp Lys Glu Phe Val Lys Asn Leu Cys Thr
 1570 1575 1580
 35 Asp Tyr Lys Ser Val Asp Ser Phe Leu Lys Lys Leu Lys Glu Gly Pro
 1585 1590 1595 1600
 Cys Cys Asn Lys Asn Thr Lys Asp Ser Lys Ile Asp Phe Lys Asp Thr
 1605 1610 1615
 Glu Glu Thr Phe Arg Asn Ala Glu Tyr Cys Asp Pro Cys Pro Val Phe
 40 1620 1625 1630
 Gly Val Ile Cys Asn Asn Gly Asp Cys Ser Asn Ser Thr Glu Lys Lys
 1635 1640 1645
 Cys Asp Ala Gln Glu Phe Lys Val Thr Tyr Asp Val Lys Asn Lys Glu
 1650 1655 1660
 45 Asn Pro Asn Lys Glu Val Asn Met Leu Val Ser Asp Lys Thr Ala Lys
 1665 1670 1675 1680
 Lys Tyr Pro Gly Asp Leu Asn Gly Val Cys Glu Asn Ser Ser Ile Phe
 1685 1690 1695
 50 Glu Gly Ile Arg Glu Asp Lys Trp Ser Cys Gly Tyr Phe Cys Gly Leu
 1700 1705 1710
 Asp Ile Cys Thr Pro Asn Lys Thr Thr Gly Asp Ile His Asp Lys Gln
 1715 1720 1725
 Asn Ala Pro Ile Arg Val Leu Phe Lys Arg Trp Ile Glu Asn Phe Leu
 1730 1735 1740
 55 Lys Asp His Asn Lys Ile Lys Asp Lys Ile Ser Leu Cys Ile Asn Asn
 1745 1750 1755 1760
 Glu Asn Arg Asn Ile Cys Thr Asp Val Cys Arg Lys Asn Cys Glu Cys
 1765 1770 1775
 Ile Asp Lys Trp Ile Glu Met Lys Met Lys Glu Trp Lys Ile Val Arg

	1780	1785	1790
	Asp Arg Tyr Val Lys Gln Tyr Asn Val Ala Asp Ser Val Val Tyr Glu		
	1795	1800	1805
	Val Arg Arg Phe Leu Glu Gly Leu Gln Pro Gln Asn Asp Leu Glu Lys		
5	1810	1815	1820
	Val Lys Gly Asp Val Asn Asp Leu Arg Asp Leu Glu Glu Leu Ser Glu		
	1825	1830	1835
	Cys Thr Asn Thr Val Ser Thr Glu Asn Arg Lys Cys Arg Lys Lys Asp		
	1845	1850	1855
10	Val Val Glu Ser Leu Leu Asn Lys Leu Lys Asn Glu Ile Arg His Cys		
	1860	1865	1870
	Lys Asn Glu Arg Asp Asp Ser Met Gly Lys Glu Ser Cys Lys Thr Leu		
	1875	1880	1885
	Pro Glu Pro Thr Asp Asp Pro Gln Thr Asp Ser Asp Thr His Asp Thr		
15	1890	1895	1900
	Pro Asp Ile Pro Pro Gly Asp Val Ala Pro Thr Phe Cys Asn Val Pro		
	1905	1910	1915
	Ala Asn Pro Cys Gly Asp Lys Ser Ala Thr Asn Val Val Asn Val Thr		
	1925	1930	1935
20	Glu Val Ala Lys Glu Met His Glu Glu Ala His Lys Asp Met Leu Glu		
	1940	1945	1950
	Arg Ser Val Lys Lys Val Glu Ser Lys Val Lys Asp Ser Thr Val Glu		
	1955	1960	1965
	Ser Val Leu Arg Ala Asp Ala Ser Lys Gly Glu Tyr Lys His Glu Gly		
25	1970	1975	1980
	Asn Pro Asp Asp Leu Lys His Asn Met Cys Asn Ile Thr Lys Glu His		
	1985	1990	1995
	Thr Asn Tyr Gln Lys Arg Gly Gly Tyr Asn Tyr Arg Gly Pro Cys Thr		
	2005	2010	2015
30	Gly Lys Gly Asn Gly Lys Asp Thr Arg Phe Val Ile Gly Thr Ile Trp		
	2020	2025	2030
	Lys Asp Glu Asp Glu Lys Asp Glu Thr Ile Lys Val Leu Leu Pro Pro		
	2035	2040	2045
	Arg Arg Arg His Met Cys Thr Ser Asn Leu Glu Tyr Leu Leu His Val		
35	2050	2055	2060
	Asn Lys Gly Pro Leu Leu Lys Val Glu Pro Asp Lys Ile Asn His Ser		
	2065	2070	2075
	Phe Leu Gly Asp Val Leu Leu Ala Ala Lys Tyr Glu Ala Glu Phe Ile		
	2085	2090	2095
40	Lys Thr Asn Tyr Thr Arg Leu Asn Gly Gln Asn Asp Asn Gly Ala Lys		
	2100	2105	2110
	Cys Arg Ala Met Lys Tyr Ser Phe Ala Asp Ile Gly Asp Ile Ile Arg		
	2115	2120	2125
	Gly Lys Asp Leu Trp Gly Ile Gln Asp Phe Lys Asp Leu Gln Thr Lys		
45	2130	2135	2140
	Leu Val Thr Ile Phe Gly Lys Ile Lys Glu Glu Ile Pro Asp Ile Lys		
	2145	2150	2155
	Lys Lys Tyr Ser Ser Glu Asn Pro Pro Tyr Thr Thr Leu Arg Glu His		
	2165	2170	2175
50	Trp Trp Glu Ala Asn Arg Ala Lys Val Trp Glu Ala Met Gln Cys Pro		
	2180	2185	2190
	Thr Ile Pro Pro Val Thr Thr Ser Cys Asp Thr Thr Val Thr Pro		
	2195	2200	2205
	Leu Val Asp Tyr Ile Pro Gln Arg Leu Arg Trp Met Thr Glu Trp Ala		
55	2210	2215	2220
	Glu Trp Phe Cys Lys Met Gln Ser Gln Glu Tyr Glu Val Leu Val Lys		
	2225	2230	2235
	Gln Cys Arg Asn Cys Arg Ser Gly Ile Cys Glu Asn Gly Lys Asp Asp		
	2245	2250	2255

Cys Val Lys Cys Thr Gln Ala Cys Asn Thr Tyr Lys Gln Lys Ile Lys
 2260 2265 2270
 Lys Trp Glu Asp Gln Trp Lys Glu Ile Ser Lys Lys Tyr Lys Thr Leu
 2275 2280 2285
 5 Tyr Gln Gln Ala Lys Gly Ser Val Asn Gly Ala Thr Thr Ser Ser Thr
 2290 2295 2300
 Thr Asp Glu Lys Asp Lys Asp Val Val Asp Phe Leu Lys Met Leu His
 2305 2310 2315 2320
 Gln Lys Asn Thr Asp Asn Thr Ile Tyr Thr Ala Ala Gly Phe Ile
 10 2325 2330 2335
 His Gln Glu Ala His Met Thr Asp Cys Gln Lys Gln Thr Ile Phe Cys
 2340 2345 2350
 Lys Asn Thr Ser Tyr Asn Asp Lys Lys Lys Tyr Ala Phe Arg His Pro
 2355 2360 2365
 15 Pro His Asp His Asp Asp Ala Cys Ala Cys Arg Pro Pro Ser Thr Pro
 2370 2375 2380
 Val Asp Val Ser Arg Lys Leu Asp Thr Gln Arg Asp Pro Lys Lys Glu
 2385 2390 2395 2400
 Glu Ser Glu Pro Glu Ser Glu Glu Glu Asp Asp Ala Glu Glu Glu
 20 2405 2410 2415
 Glu Glu Pro Ala Lys Glu Thr Ala Thr Glu Thr Thr Gln Pro Ala
 2420 2425 2430
 Ala Pro Ala Gly Pro Pro Val Thr Pro Val Pro Glu Leu Pro Gly Pro
 2435 2440 2445
 25 Pro Ala Pro Ala Gly Pro Ala Ala Asp Gly Pro Ile Glu Asp Asp Glu
 2450 2455 2460
 Asp Ala Glu Asn Glu Asp Asp Asp Asp Val Gly Ser Ala Thr Gly Thr
 2465 2470 2475 2480
 Glu Asp Asp Asp Asp Asp Glu Asp Asp Asp Glu Asp Glu Glu Asp
 30 2485 2490 2495
 Ser Ala Asp Glu Gly Glu Gly Glu Gly Asp Gly Gly Asp Val Gly Glu
 2500 2505 2510
 Glu Glu Asp Glu Asp His Gly Gly Gln Glu Ala Glu Gly Val Val Pro
 2515 2520 2525
 35 Gln Pro Ala Ala Pro Gln Pro Pro Thr Pro Gln Leu Leu Asp Asp Pro
 2530 2535 2540
 Leu Leu Lys Thr Ala Leu Met Ser Ser Thr Ile Leu Trp Met Val Gly
 2545 2550 2555 2560
 Ile Gly Phe Ala Ala Leu Thr Tyr Phe Leu Leu Lys Lys Lys Ser Lys
 40 2565 2570 2575
 Ser Ser Val Asp Leu Leu Arg Val Leu Asn Ile Pro Lys Gly Asp Tyr
 2580 2585 2590
 Glu Met Pro Thr Leu Lys Ser Lys Asn Arg Tyr Ile Pro Tyr Arg Ser
 2595 2600 2605
 45 Gly Ser Tyr Lys Gly Lys Thr Tyr Ile Tyr Met Glu Gly Asp Ser Asp
 2610 2615 2620
 Ser Gly His Tyr Tyr Glu Asp Thr Thr Asp Ile Thr Ser Ser Glu Ser
 2625 2630 2635 2640
 Glu Tyr Glu Glu Leu Asp Ile Asn Glu Ile Tyr Pro Tyr Gln Ser Pro
 50 2645 2650 2655
 Lys Tyr Lys Thr Leu Ile Glu Val Val Leu Glu Pro Ser Lys Ser Asn
 2660 2665 2670
 Gly Asn Thr Pro Ser Lys Gly Asp Gly Asn Thr Leu Gly Asp Asp Met
 2675 2680 2685
 55 Val Pro Thr Thr Asn Thr Phe Thr Asp Glu Glu Trp Ser Glu Leu Lys
 2690 2695 2700
 His Asp Phe Ile Ser Gln Tyr Ile Gln Ser Glu Pro Leu Asp Val Pro
 2705 2710 2715 2720
 Lys Val Gly Val Ser Lys Glu Leu Pro Met Asn Ile Gly Gly Asn Val

	2725	2730	2735
	Leu Asp Asp Gly Ile Asn Glu Lys Pro Phe Ile Thr Ser Ile His Asp		
	2740	2745	2750
5	Arg Asp Leu Tyr Thr Gly Glu Glu Ile Lys Tyr Asn Ile Asn Met Gly		
	2755	2760	2765
	Thr Asn Ser Met Asp Asp Pro Thr Tyr Val Ser Asn Asn Val Tyr Ser		
	2770	2775	2780
	Gly Ile Asp Leu Ile Asn Asp Thr Leu Ser Gly Asn Gln His Ile Asp		
	2785	2790	2795
10			2800
	Ile Tyr Asp Glu Val Leu Lys Arg Lys Glu Asn Glu Leu Phe Gly Thr		
	2805	2810	2815
	Asn Tyr Lys Asn Thr Ser Asn Asn Asn Val Ala Lys Leu Thr Asn		
	2820	2825	2830
15	Ser Asp Pro Ile Met Asn Gln Leu Asp Leu Leu His Thr Trp Leu Asp		
	2835	2840	2845
	Arg His Arg Asp Met Cys Glu Lys Trp Asn Lys Lys Glu Glu Leu Leu		
	2850	2855	2860
	Asp Lys Leu Asn Glu Gln Trp Asn Lys Asp Asn Asp Gly Gly Asp Ile		
	2865	2870	2875
20			2880
	Pro Asn Asp Asn Lys Lys Leu Asn Thr Asp Val Ser Ile Gln Ile Asp		
	2885	2890	2895
	Ile Asp Glu Asn Lys Gly Lys Lys Glu Phe Ser Asn Met Asp Thr Asn		
	2900	2905	2910
25	Val Asp Thr Pro Thr Met Asp Ser Ile Leu Asp Asp Leu Glu Thr Tyr		
	2915	2920	2925
	Asn Glu Pro Phe Tyr Asp Ile Phe Glu Asp Asp Val Tyr Tyr Asp Val		
	2930	2935	2940
	Tyr Asp Glu Asn Pro Phe Val Asp Asp Ile Pro Met Asp His Asn Lys		
	2945	2950	2955
30			2960
	Val Asp Val Pro Lys Lys Val His Ile Glu Met Lys Ile Leu Asn Asn		
	2965	2970	2975
	Thr Ser Asn Gly Ser Leu Glu Gln Gln Phe Pro Ile Ser Asp Val Trp		
	2980	2985	2990
35	Asn Ile		

	<210> 5		
	<211> 10041		
40	<212> DNA		
	<213> <i>Plasmodium falciparum</i>		
	<220>		
	<221> gene		
45	<222> (0)...(0)		
	<223> PF13_0003		
	<400> 5		
	atgggaaaata cacaatcatc agaggaagag gaagctaaaa gccctagttt aacagaaaagt 60		
50	cacaacagtg caaggggtgt tttggaagaa attggaaaaaa agataaaaaga taagacagaa 120		
	aaagagagta aacatgttaag gcaattgaaa ggaaaaattat caaatgc当地 atttgctgat 180		
	cgatttgtata aggaatctgg tggtgattta aggtctgctt attcagatgc ttgttcaactt 240		
	acatacaaat ttcatactaa tataacaact gatggggggg atggaaggca tccttgc当地 300		
	ggttagggaaa acaatcggtt ttctgaaaagt caagaatatg gatgttagtaa tgtatata 360		
55	aaaggaaaatg aaaataacag taatggtaca gcatgtgtac caccagaag aagacatata 420		
	tgtgatcaaa attttagataat tttagataat cctcacactg atgatactga tgatttgg 480		
	ggaaatgtgt tagttacagc aaaatacgaa ggttaattata ttgttagtaa tc当地ccagat 540		
	aaaaacagca atggaaaataa atcaggaata tgtacttctc ttgcacgc当地 tttgcagat 600		
	ataggagata ttgtaaagagg aagagatatg tttaaatcta atgaaaaggt agaaatcggt 660		

ctaaaaaagg ttttcgagaa aataaataat ggattgaaga aaataggaat taatgattat 720
 aatgatatat ctggaaatata ttataaattt aaggaagctt ggtggacggc taaccgcgtat 780
 caagtatgga aagccataac atgttagagcc ccaaacgggg ctaattattt tagaaaaggt 840
 ttagatggaa aaataatttt ttcagataat ggaccatgtg gtcgtaagga actaatcggt 900
 5 cctacattt tagattatgt ccctcaattt ttaagatggt taaatgaatg gtcggaagag 960
 ttttgcgaa taaaaatata aaaaatagga aatattaaga aatcctgtac tggagaaagt 1020
 aataataaac attgttagtcg tgagggttac gattgtataa aaacaaatct aagacttaat 1080
 gaaattttt tggatctaga atgtccacgt tgcagatg atgttaatc gtatgaaaca 1140
 tggtagaaa aaaaaaaaaa agaatttaat aaacaaaaga aaaaatacga aaaagaagtt 1200
 10 gatgctacac aaaataatga taatacggaa gaactaaaaaa gttcatataa agaagttat aatggaatct ataataaaaaa attttatgtat 1260
 atatgtgaac atattgataa aaaaattcca atggactata ataataactga gaaaacattt 1380
 tcccgttcag agtattgtaa atcatgtcct ataacagata tttatgtga tgataatgaa 1440
 tgtaaaaacca ttaatgaatt taaatgtaga gaaataaaaaa gtatgcctaa tataagaaaa 1500
 15 aacgaaaatg aaacccctat tgatattgtat attctggta atgttaataa caaaaaggtt 1560
 attacgcattt atttaaagaa taattacggaa aactgtgatc ttttaaaaaa actaggagaa 1620
 caaaaatgga aatgtaaata taaatgttac ttagatgtat gtgaaccgag aaatttggat 1680
 agtaatataat ataatgaacg atatatctca attaaagtac tatttaaacg gtggtagaa 1740
 tatttcttag aagattacaa taaattaaag gaaaaattga accatgcattt gtataatgta 1800
 20 caagaaatcg tatgtataaa tgaatgtaa caaaattgtg aatgcgtaga aaaatggata 1860
 aaagaaaaaa gggagaatg gaaaaaaaata aagatcgatc acgtacaaca atatgaaagt 1920
 aaagatgaag atgtttcttc taaacttaaa aatttttga aacaggaact gtttactaat 1980
 tatgttaaaa atgccttgaa caaggatgaa acgttagata gtatgaaaga atctactgaa 2040
 tgcattgatc ctaataaaacc caaaggaaaa ccatgtaaaca ataacgatgt cataaatattt 2100
 25 ttacttaata gacttgaaaa acaaattcgat gaaaaacctt gtgttgatatacctaaactt aattgcaaaa agaagcacga agaaaaaggaa 2160
 gacgaaacac cacgcgcctt taatccgtgt gtagataaaa atgattctca acccactaaa 2220
 actgtgagtt atatcgctag acaaattcgat cgaaggccaa aagcacaaat gacaaaaaat 2280
 agtgttttg atggtgataa taagttggaa ggcgatataat ttaagggttac atttagaaat 2340
 30 ggcgggtcg gaaaaaacctt gaatggagat attgcaaga ttgacaaaac gtattccat 2400
 gacagtctg gtactcctac agatggacct tggtaaggca aaggcgatcg gtttaaaata 2460
 ggaacggact ggcaagggtgaa tagtttgcgaa aaccaccaat accgtgggat ttatatgcct 2520
 cctagacgtc aacattttg tacatcgaa ttagaaaaat tagatgttag tagagtcat 2580
 agaaatggta atgctagcaa ttcattattt ggtgatgtgc tgctcgacg aaagtatgaa 2640
 35 gcagaacgaa caaagaacca ttatgtatct aaaaaggaag aacattccga agcttgcgt 2700
 gctgtgcgtt acagtttgc cgatttagga gatattatac gaggaaaaga catgtggat 2760
 aaaaatcatg gcgagaagaa aacacaaagaa aatttagaaa gaatatttgc taaaattaaa 2820
 gagcaacttc ttaatagcag tatcaaagat aaatataagg atgatgacaa agcaacaccc 2880
 aaatataaaac attaaagaga agattgggtt gaaGCCatc gttcacaggt atggaaagca 2940
 40 atgcaatgcc caccaaaaaa cggtactttc ccatgtaaaaa gtgatcatac accgctacat 3000
 gactacatcc cccaaagatt aagatggatg accgaatggg cagaatggta ctgtaaagaa 3060
 cagtacggc tgtatggaga gttgggtggg acgtgtggta agtgtatgca taagggaaaa 3120
 tgtaagcaag gtaatggca ttgtgttaacg tgcaagccag catgtgaaaa atataaaaaaa 3180
 ttttataata catggcaacc tcaatggaaa caaatgaaac aaaaatactc ccagttatac 3240
 45 gaagaagcaa aaaagtataa tgatgtatgc agaaaaagata ccacaaacaa agacgattat 3300
 gtcctcaat tcttgcacaa attactcactg caaaacaaag gaaataaaaac atatgataact 3360
 gctgaaggat atgtacacca agaagcacat attagtgtt gtcagaaaca aacacaattt 3420
 tgtaaaaaaa gaaatggta gatcccaagt agtgcatacag agaccgacaa caattatgcc 3480
 tttcgccctc aaccacacga ccatgtatggat gtgtgtgatgt gtaatactag acagaagacg 3540
 50 aaggtaacgaa aaaaaaaaaa aaaagttgtatgc gcatgtgaaa tggcaaaaac acttttgcac 3600
 aacaacgatc gaaccataag aataggacaa tgcaacgtt aagatgaagg aaatgcagaa 3660
 tatccaaat gggattgtaa ttctcagatt catacaacac ataatggacg atgtatgcct 3720
 cctagaagac aaaaattatg cgtatatttt tttgcaatc catctcaat aggaagtata 3780
 aataaacaag ataatttaag aaaagcattt attatatctg cagcagcaga aacatttcgt 3840
 55 tcatggcagt attataagag taagaatggt ggtgaaaacc tcacaaactca attaaaagat 3900
 ggaactattt ctgacgattt taaacgtcaa atgttctata catatggaga ttatagagat 3960
 tttttatggt gaaaccgatatacataaaaggt ctgggtgaaag ggactgcctt agaaaaagcaa 4020
 ataaatattt ttttcccaaa tgggtgtccga aaaattccta atgaaaaaaac acgtgaaaag 4080
 tggtagacag atcacggacc tgagatatgg aaaggtatgt tatgcgcctt aacaaatggt 4140

	ctcagtaaaa	gcgaaaaaaaaaa	aacaaaaata	ttcgacgact	actcacacga	caaagtcaac	4260
	caatccaaaa	atggtaaccc	ttccctcgag	gatttcgcaa	aaaaacctca	atttttcaga	4320
	tggtttattt	aatggagtga	tgaattttgt	cgggaaagga	agaagaagga	agaggaggt	4380
	gaaagggatt	gtaaggatga	atatgagggga	tgtaaaagg	agaaaaatgg	taaatgtgtt	4440
5	accgcatgt	aagcatataa	agaatacatt	acaaacaaaa	aagaagaata	tgatagtcaa	4500
	aaagggaaat	ttgacgttga	aaaaacagag	aagaaacaag	gatatgaaga	ttattcttag	4560
	aaacaggctt	ctgaatattt	gaaagaaaaaa	tgtataaaat	catcatgtaa	ttgtatgaag	4620
	aaagttacag	aaatttccaa	ttactggacc	aaccctcata	aaacctacga	caccgaaaat	4680
	cttggaatca	aatgtgaatg	cccccccttca	ccctgcacca	tcgtggatgg	catcctcagc	4740
10	ccacaaaatt	cgagttcgta	cgccgaaaggg	tgtaaaatgg	aatatggaa	gatgtcacaa	4800
	gggggtacgg	aatgggattt	tagaaaaaaa	agtgggggt	aagggtgtaa	tgaggacgg	4860
	gatgttgtat	gtataacctcc	aaggagaagg	agattatatg	taaagaattt	acaggattt	4920
	actggtaag	aatcactagt	ggatttacga	aaagctttt	ttaagtgtgc	tgctatagaa	4980
	acattttttgc	cttggcatga	attttaaaaaa	gaaaaagaaa	gagagaaaaa	agaaaaaaaat	5040
15	gaacaagatg	tacaatataa	atcatctgtc	ttagaaaaatc	ttcaaaagca	gtaaaaaaaaat	5100
	ggagaaaatag	atgatgagtt	taaaagacaa	atgttctata	catttgcaga	ttatagagat	5160
	atatgtttag	ggaaggatat	aggttaacgac	gtggatggaa	ttaatgaaaa	aatagataca	5220
	attttgcaaa	aaaatggaaa	acctaataat	atcgaagaat	ataaaaaatg	gtggcaaaaa	5280
	catggcatgt	agatatggg	aggaatgtt	tgtgtctaa	gctacaatac	cgaacacaaa	5340
20	gagatggata	aagaacttgc	caacaaattt	accgaacaaa	agaacgtaa	caaaaacacg	5400
	tacgacaccg	tcacaattt	tgggttccc	attgttaata	ccaaatgg	gaaatttgc	5460
	tctaggcccc	catttttgc	ttgggttagaa	gaatgggcag	atgagtttt	tagaaaaacga	5520
	acacataaat	tggaaaaat	tcaaaatgaa	tgtaagggag	taagtgtac	aatcagtgt	5580
	gatgtatgt	gttttactg	cgatgaaatg	tgtccaaaaa	aggatggag	tttgaacacg	5640
25	tttaaatgtc	tgagttgtgc	caaattttgt	agattttata	aaaagtggat	aagttagaaaa	5700
	aaagagggat	ttgataaaca	aagcaaaaaaa	tacgaaaacg	aaattgacga	tgttaaacat	5760
	aattctgtata	acatatatgg	aaaagacttt	cttggaaactc	ttgatcaaca	atataagtct	5820
	gttgaattat	tttttagaaaa	agtaaaaagg	ccatgttcta	ttaataataa	taatgaagaa	5880
	tgtaaaatag	attttataa	accaaaggat	acatttggc	atgcaaaaaa	ttgtggtcca	5940
30	tgttctgaaa	tttagattca	gtgtatagag	gataatagca	attgggttac	tacaaataca	6000
	tgcaataaaa	caacttttaa	gtttacagaa	gataataaaag	atacgaaga	agatagtgaa	6060
	caatttaggt	tgcttattag	tgataataca	gtacaaaatt	ttgcagatgg	ttacagaat	6120
	gattgtaaag	atgcagatat	ctttaaaggt	cttagaaaaag	accaatggc	atgtggttat	6180
	ttttgttaatt	tagatataatg	tagtctgaaa	acttctcatg	gggaaaacaa	ttataaaacaa	6240
35	aatatattaa	ttagggcatt	gtttaaacga	tggtagaaac	attttttaga	agactataat	6300
	aaaattaatg	acaaaatttc	acattgtatg	aaaaatgggt	aaggatccac	atgtataaaa	6360
	ggatgtgaaa	taaaatgtaa	ttgtgtaaat	aattggataa	agaagaaaac	gttagaaatgg	6420
	gaaatagttac	gagatcgaaa	ctttaaacaa	tataatgtt	attcagaaaa	atcttttaca	6480
	gtgaaaagtt	tttttagagca	ggctccattt	gacagtgtat	ttcaaaaagc	tataaaacct	6540
40	tttggaaaat	tacgtactt	cgaggattca	attgtatgt	atggaaactac	gagcgcacga	6600
	aaggaaaaag	gtacagaaaa	ggatgtcgta	atatgtttgc	ttgataaact	tcaaaaaacaa	6660
	atagaaaactt	gtcaaacgaa	acataaagaa	acatctggaa	atacatgttc	cccacccccc	6720
	aaccccgaca	cacaaacaga	cacaccat	ccacttgcgt	cttttctcc	ccctttttgt	6780
	aacgttccctc	ctaattccat	tggcgacaaa	gatgcacca	acgtggttgg	agttgaagtg	6840
45	ctggcgaagg	aatgcagga	ggcggcacat	aaaagcatgt	taagtgttag	tgctgttgat	6900
	agtggtaagg	gtgataaggg	tgagagtagt	agtggtaaga	gtagtttgg	aggagatata	6960
	tccttagcag	attttaaaaaa	tggctttat	ccaaatgggt	tgaagaacgt	atgtcaaata	7020
	acggaaaaac	attcctatgc	taatggtgca	tcaaaggatc	tttgaatgg	aaaaggaaac	7080
	ggcaaggacc	agagatttaa	aatagaaacc	caatggaaag	atacagccaa	aagcggtaaa	7140
50	cacgttgcac	tctatttacc	ttcacgcacgc	gaacatataat	gtacctaaa	tttggaaat	7200
	ttacttaagg	gtaatagtga	ttagattat	aagggtggaa	ataacaaaat	taatcattcc	7260
	tttttgggag	aggtatttgc	agcagcaaaa	tatgaagcag	aattcataaa	aaccaattat	7320
	acgagattaa	atggccaaaa	tgacaatgg	gctaaatgt	gagctatgaa	atatagttt	7380
	gctgatata	gagatattgt	acgaggaaga	gatctgtgg	aacataatga	tttaaaaag	7440
55	ctagaacgag	atttggtaaa	aatattttgt	aaaattaaag	agggattac	tgatgagaca	7500
	accaaaaaac	aatatgaaaa	ggatgacaca	gacaataaaac	aattacgtt	tgattggtg	7560
	gaagcttaacc	gtgatcaagt	atgggaagca	atgcagtgt	aaacaacaat	accaccagtc	7620
	accacaagtt	gtgatactac	cactgttacc	cctttgtgg	attacatccc	ccaaagattt	7680
	cgttggatga	tggatgggc	agaatggat	tgtaaatatc	aatcqaqqc	atataqtqaq	7740

ttgaggaagg ggtgtgagga ttgttaggagt tggaaatgtt tgaagggtga tagtaatgt 7800
 gagaattgca caaaagctt taaagactat aatagtaaaa tagaaccatg gaaacagcaa 7860
 tggacaaaaa taaaagaaaa atacgaagaa ttatacaaaa aagcacaaaa tagtgatacc 7920
 tctaatacg 5 ttacacgaaa aaaataaaaga caataagata tattatactg ctgcaggata tatacatcaa 8040
 caagcaaaat attttagattt tacacaacaa acacatttt gtataaaaaa aaatggcgag 8100
 acattaccta gcggtagaga caatgacaaa tatgcttta agaaaccgccc aaaaaaatat 8160
 gaacgagcat gtaaaatgtca cgagaaacag gaaccaccac ctccctaaggt accagaagat 8220
 tcagaggacg atagagaacg atcagaacct ggtgaagatg cactccctgt actcccacca 8280
 10 gaagaaatag aacaagagga agaaccgaa gaaacttccg tagacactac acaagatgag 8340
 gaggaaccag catccgaagg aggtggccca tcgggatcac caacagaaga aagtgggaa 8400
 ccaagagaaa atagtgatag ctccgacccc aaacctgacc aaaaccccgaa agccaaacccc 8460
 gaacaaacac cgatactcaa acccgaagaa gaagcaccac caaaatcaaa accacccgat 8520
 ggagatcgtg gcgttaggacg ttcttttagga ccaacccac gtctgaagt tgaacccgag 8580
 15 gaatccgaaa acgaagacgt cgaagacgaa gatgacgaag aggaggaaga agaccccgac 8640
 gacgaccccg aggcggagtc ggaggaggaa gatgaagatc acggcggccca ggaggcggag 8700
 gcggtaccac cacaacccca agcaccagca cctctacccc ctccctccacc acctttaccc 8760
 cccctaaaaa cccgcctcat gtcttctacc atcatgtgga gtgttaggtat cggtttgcg 8820
 gccatcgtt actttttact aaagaaaaaa ccgaaatcac ctgttaccc catacgtgta 8880
 20 attgatatcc ataaaggcga ttatggaata cctacattgg aatccaaaaaa tagatatac 8940
 ccctatgtga gtgatacata caaaggcaaa acatataat atatgaaagg agataactagt 9000
 ggagatgaaa aatatggatt tatgtctgt actactgata taacttcctc cgaaagtgag 9060
 tatgaagaat tggatattaa tgatataat gtaccaggtt gtcctaaata taaaacattg 9120
 atagaagtag tattggaacc atcaaaaaagt aatggtaaca cactaggtt tgatatggta 9180
 25 cctaccacga atacatttc agatgaggaa tggaaatgaaat tggaaacacga ttttatatca 9240
 caatatatac aaagtgaacc actgaatgtt ccacaatatg atgtattaaa ggagttacca 9300
 atgaatatac tagtaatgt ttttagatgt ggtataaaacg aaaaacccctt tattacttct 9360
 attcatgata gggatttaaa tagtgaggaa gaaattagtt ataataattaa tatgagtact 9420
 aatagtatgg atgatccaaa atatgtatca aataatgtat attctggat agatttaatt 9480
 30 aatgattcac taagtgggtt taaacctatt gatataatg atgaagtgtt aaaaagaaaa 9540
 gaaaatgaat tatttggaaac aaattataag aaaaatacat caaataacaa ttagctaaa 9600
 ttaacaaata gtgatccaaat tatgaaccaa ttagattgt tacataaattt gtttagataga 9660
 catagagata tgggtgagat gtggataat aaagaggaag tattagataa attaaaagaa 9720
 caatggaata aagataatgt tgggtggtat atatcaatgtt atagtaacaa aaggtgaat 9780
 35 acggatgttt cgattgaaat agatatggat gatcctaaag gaaagaagga atttagtaat 9840
 atggatacta tcttggataa tatagaagat gatataattt atgatgtaaa tgatgaaaac 9900
 ccatctgtga atgatatacc tatggatcat aataaaatgtt atgtacctaa gaaagtacat 9960
 gttgaaatgtt aaatccttaa taatatacc actggatcct tggaaacaaca atttcctata 10020
 tcggatgtt ggaatataa a 10041

40

<210> 6
 <211> 3346
 45 <212> PRT
 <213> Plasmodium falciparum

<400> 6
 Met Gly Asn Thr Gln Ser Ser Glu Glu Glu Ala Lys Ser Pro Ser
 50 1 5 10 15
 Leu Thr Glu Ser His Asn Ser Ala Arg Gly Val Leu Glu Ile Gly
 20 25 30
 Lys Lys Ile Lys Asp Lys Thr Glu Lys Glu Ser Lys His Val Arg Gln
 35 40 45
 55 Leu Lys Gly Lys Leu Ser Asn Ala Lys Phe Ala Asp Arg Leu Tyr Lys
 50 55 60
 Glu Ser Gly Gly Asp Leu Arg Ser Ala Tyr Ser Asp Ala Cys Ser Leu
 65 70 75 80
 Thr Tyr Lys Phe His Thr Asn Ile Thr Thr Asp Gly Gly Asp Gly Arg

	85	90	95													
His	Pro	Cys	His	Gly	Arg	Glu	Asn	Asn	Arg	Phe	Ser	Glu	Ser	Gln	Glu	
			100			105						110				
Tyr	Gly	Cys	Ser	Asn	Val	Tyr	Ile	Lys	Gly	Asn	Glu	Asn	Asn	Ser	Asn	
5			115			120						125				
Gly	Thr	Ala	Cys	Val	Pro	Pro	Arg	Arg	Arg	His	Ile	Cys	Asp	Gln	Asn	
			130			135					140					
Leu	Glu	Phe	Leu	Asp	Asn	Pro	His	Thr	Asp	Asp	Thr	Asp	Asp	Leu	Leu	
			145			150					155			160		
10	Gly	Asn	Val	Leu	Val	Thr	Ala	Lys	Tyr	Glu	Gly	Asn	Tyr	Ile	Val	Ser
						165				170			175			
Asn	His	Pro	Asp	Lys	Asn	Ser	Asn	Gly	Asn	Lys	Ser	Gly	Ile	Cys	Thr	
						180				185			190			
Ser	Leu	Ala	Arg	Ser	Phe	Ala	Asp	Ile	Gly	Asp	Ile	Val	Arg	Gly	Arg	
15						195				200			205			
Asp	Met	Phe	Lys	Ser	Asn	Glu	Lys	Val	Glu	Ile	Gly	Leu	Lys	Lys	Val	
						210				215			220			
Phe	Glu	Lys	Ile	Asn	Asn	Gly	Leu	Lys	Lys	Ile	Gly	Ile	Asn	Asp	Tyr	
						225				230			235		240	
20	Asn	Asp	Ile	Ser	Gly	Asn	Tyr	Tyr	Lys	Leu	Arg	Glu	Ala	Trp	Trp	Thr
						245				250			255			
Ala	Asn	Arg	Asp	Gln	Val	Trp	Lys	Ala	Ile	Thr	Cys	Arg	Ala	Pro	Asn	
						260				265			270			
Gly	Ala	Asn	Tyr	Phe	Arg	Lys	Gly	Leu	Asp	Gly	Lys	Ile	Ile	Phe	Ser	
25						275				280			285	.		
Asp	Asn	Gly	Pro	Cys	Gly	Arg	Lys	Glu	Leu	Ile	Val	Pro	Thr	Tyr	Leu	
						290				295			300			
Asp	Tyr	Val	Pro	Gln	Phe	Leu	Arg	Trp	Leu	Asn	Glu	Trp	Ser	Glu	Glu	
						305				310			315		320	
30	Phe	Cys	Arg	Ile	Lys	Asn	Ile	Lys	Ile	Gly	Asn	Ile	Lys	Lys	Ser	Cys
						325				330			335			
Thr	Gly	Glu	Ser	Asn	Asn	Lys	His	Cys	Ser	Arg	Glu	Gly	Tyr	Asp	Cys	
						340				345			350			
Asn	Lys	Thr	Asn	Leu	Arg	Leu	Asn	Glu	Ile	Phe	Met	Asp	Leu	Glu	Cys	
35						355				360			365			
Pro	Arg	Cys	Ala	Asp	Asp	Cys	Lys	Ser	Tyr	Glu	Thr	Trp	Val	Glu	Lys	
						370				375			380			
Lys	Lys	Lys	Glu	Phe	Asn	Lys	Gln	Lys	Lys	Tyr	Glu	Lys	Glu	Val		
						385				390			395		400	
40	Asp	Ala	Thr	Gln	Asn	Asn	Asp	Asn	Asn	Glu	Asn	Gly	Ile	Tyr	Asn	Lys
						405				410			415			
Lys	Phe	Tyr	Asp	Glu	Leu	Lys	Ser	Ser	Tyr	Lys	Glu	Val	Asn	Ser	Phe	
						420				425			430			
Phe	Glu	Leu	Leu	Asn	Lys	Gly	Pro	Ile	Cys	Glu	His	Ile	Asp	Lys	Lys	
45						435				440			445			
Ile	Pro	Met	Asp	Tyr	Asn	Asn	Thr	Glu	Lys	Thr	Phe	Ser	Arg	Ser	Glu	
						450				455			460			
Tyr	Cys	Lys	Ser	Cys	Pro	Ile	Thr	Asp	Ile	Leu	Cys	Asp	Asp	Asn	Glu	
						465				470			475		480	
50	Cys	Lys	Thr	Ile	Asn	Glu	Phe	Lys	Cys	Arg	Glu	Ile	Lys	Ser	Met	Pro
						485				490			495			
Asn	Ile	Arg	Lys	Asn	Glu	Asn	Glu	Thr	Pro	Ile	Asp	Ile	Asp	Ile	Leu	
						500				505			510			
55	Val	Asn	Val	Asn	Asn	Lys	Lys	Val	Ile	Thr	His	Asp	Leu	Lys	Asn	Asn
						515				520			525			
Tyr	Glu	Asn	Cys	Asp	Leu	Phe	Lys	Lys	Leu	Gly	Glu	Gln	Lys	Trp	Lys	
						530				535			540			
Cys	Lys	Tyr	Lys	Cys	Tyr	Leu	Asp	Val	Cys	Glu	Pro	Arg	Asn	Leu	Asp	
						545				550			555		560	

Ser Asn Ile Tyr Asn Glu Arg Tyr Ile Ser Ile Lys Val Leu Phe Lys
 565 570 575
 Arg Trp Leu Glu Tyr Phe Leu Glu Asp Tyr Asn Lys Leu Lys Glu Lys
 580 585 590
 5 Leu Asn Pro Cys Met Tyr Asn Val Gln Glu Ile Val Cys Ile Asn Glu
 595 600 605
 Cys Lys Gln Asn Cys Glu Cys Val Glu Lys Trp Ile Lys Glu Lys Arg
 610 615 620
 Glu Glu Trp Lys Lys Ile Lys Asp Arg Tyr Val Gln Gln Tyr Glu Ser
 10 625 630 635 640
 Lys Asp Glu Asp Val Ser Ser Lys Leu Lys Phe Leu Lys Gln Glu
 645 650 655
 Leu Phe Thr Asn Tyr Val Lys Asn Ala Leu Asp Lys Asp Glu Thr Leu
 660 665 670
 15 Asp Ser Met Lys Glu Ser Thr Glu Cys Ile Asp Pro Asn Lys Pro Lys
 675 680 685
 Gly Lys Pro Cys Asn Asn Asn Asp Val Ile Asn Ile Leu Leu Asn Arg
 690 695 700
 Leu Glu Lys Gln Ile Asp Asn Cys Lys Lys Lys His Glu Glu Lys Gly
 20 705 710 715 720
 Glu Lys Pro Cys Val Asp Ile Pro Lys Leu Leu Asn Asp Glu Asp Glu
 725 730 735
 Asp Glu Asp Asp Glu Thr Pro Arg Ala His Asn Pro Cys Val Asp
 740 745 750
 25 Lys Asn Asp Ser Gln Pro Thr Lys Thr Val Ser Tyr Ile Ala Arg Gln
 755 760 765
 Met His Arg Arg Ala Lys Ala Gln Met Thr Lys Asn Ser Val Val Asp
 770 775 780
 Gly Asp Asn Lys Leu Glu Gly Asp Ile Phe Lys Val Thr Phe Arg Asn
 30 785 790 795 800
 Gly Gly Val Gly Lys Asn Leu Asn Gly Asp Ile Cys Lys Ile Asp Lys
 805 810 815
 Thr Tyr Ser Asn Asp Ser Arg Gly Thr Pro Thr Asp Gly Pro Cys Glu
 820 825 830
 35 Gly Lys Gly Asp Arg Phe Lys Ile Gly Thr Asp Trp Gln Gly Asp Ser
 835 840 845
 Phe Val Asn Pro Gln Tyr Arg Gly Ile Tyr Met Pro Pro Arg Arg Gln
 850 855 860
 His Phe Cys Thr Ser Asn Leu Glu Lys Leu Asp Val Ser Arg Val Ile
 40 865 870 875 880
 Arg Asn Gly Asn Ala Ser Asn Ser Leu Leu Gly Asp Val Leu Leu Ala
 885 890 895
 Ala Lys Tyr Glu Ala Glu Arg Thr Lys Asn His Tyr Val Ser Lys Lys
 900 905 910
 45 Glu Glu His Ser Glu Ala Cys Arg Ala Val Arg Tyr Ser Phe Ala Asp
 915 920 925
 Leu Gly Asp Ile Ile Arg Gly Lys Asp Met Trp Asp Lys Asn His Gly
 930 935 940
 Glu Lys Lys Thr Gln Glu Asn Leu Glu Arg Ile Phe Ala Lys Ile Lys
 50 945 950 955 960
 Glu Gln Leu Leu Asn Ser Ser Ile Lys Asp Lys Tyr Lys Asp Asp Asp
 965 970 975
 Lys Ala Thr Pro Lys Tyr Lys Gln Leu Arg Glu Asp Trp Trp Glu Ala
 980 985 990
 55 Asn Arg Ser Gln Val Trp Glu Ala Met Gln Cys Pro Pro Lys Asn Gly
 995 1000 1005
 Thr Phe Pro Cys Lys Ser Asp His Thr Pro Leu His Asp Tyr Ile Pro
 1010 1015 1020
 Gln Arg Leu Arg Trp Met Thr Glu Trp Ala Glu Trp Tyr Cys Lys Glu

1025	1030	1035	1040
Gln Ser Arg Leu Tyr Gly Glu Leu Val Glu	Thr Cys Gly Lys Cys Met		
1045	1050	1055	
His Lys Gly Lys Cys Lys Gln Gly Asn	Gly His Cys Val Thr Cys Lys		
5 1060	1065	1070	
Pro Ala Cys Glu Lys Tyr Lys Lys Phe Ile Asn Thr Trp Gln Pro Gln			
1075	1080	1085	
Trp Lys Gln Met Glu Gln Lys Tyr Ser Gln Leu Tyr Glu Glu Ala Lys			
1090	1095	1100	
10 Lys Tyr Asn Asp Ser Ser Arg Lys Asp Thr Thr Asn Lys Asp Asp Tyr			
1105	1110	1115	1120
Val Leu Gln Phe Leu Asn Lys Leu Leu Thr Gln Asn Lys Gly Asn Lys			
1125	1130	1135	
Thr Tyr Asp Thr Ala Glu Gly Tyr Val His Gln Glu Ala His Ile Ser			
15 1140	1145	1150	
Asp Cys Gln Lys Gln Thr Gln Phe Cys Lys Lys Arg Asn Gly Glu Ile			
1155	1160	1165	
Pro Ser Ser Asp Thr Glu Thr Asp Asn Asn Tyr Ala Phe Arg Pro Gln			
1170	1175	1180	
20 Pro His Asp His Asp Glu Val Cys Glu Cys Asn Thr Arg Gln Lys Thr			
1185	1190	1195	1200
Lys Val Arg Lys Lys Lys Val Asp Ala Cys Glu Met Ala Lys			
1205	1210	1215	
Thr Leu Leu His Asn Asn Asp Gly Thr Ile Arg Ile Gly Gln Cys Lys			
25 1220	1225	1230	
Arg Lys Asp Glu Gly Asn Ala Glu Tyr Pro Lys Trp Asp Cys Asn Ser			
1235	1240	1245	
Gln Ile His Thr Thr His Asn Gly Ala Cys Met Pro Pro Arg Arg Gln			
1250	1255	1260	
30 Lys Leu Cys Val Tyr Phe Phe Ala Asn Pro Ser Gln Ile Gly Ser Ile			
1265	1270	1275	1280
Asn Lys Gln Asp Asn Leu Arg Lys Ala Phe Ile Ile Ser Ala Ala Ala			
1285	1290	1295	
Glu Thr Phe Arg Ser Trp Gln Tyr Tyr Lys Ser Lys Asn Gly Gly Glu			
35 1300	1305	1310	
Asn Leu Gln Thr Gln Leu Lys Asp Gly Thr Ile Pro Asp Asp Phe Lys			
1315	1320	1325	
Arg Gln Met Phe Tyr Thr Tyr Gly Asp Tyr Arg Asp Phe Leu Phe Gly			
1330	1335	1340	
40 Thr Asp Ile Ser Lys Gly Leu Gly Glu Gly Thr Ala Leu Glu Lys Gln			
1345	1350	1355	1360
Ile Asn Ile Leu Phe Pro Asn Gly Val Arg Lys Ile Pro Asn Glu Lys			
1365	1370	1375	
Thr Arg Glu Lys Trp Trp Thr Asp His Gly Pro Glu Ile Trp Lys Gly			
45 1380	1385	1390	
Met Leu Cys Ala Leu Thr Asn Gly Leu Ser Glu Ser Glu Lys Lys Thr			
1395	1400	1405	
Lys Ile Phe Asp Asp Tyr Ser His Asp Lys Val Asn Gln Ser Lys Asn			
1410	1415	1420	
50 Gly Asn Pro Ser Leu Glu Asp Phe Ala Lys Lys Pro Gln Phe Phe Arg			
1425	1430	1435	1440
Trp Phe Ile Glu Trp Ser Asp Glu Phe Cys Arg Glu Arg Lys Lys Lys			
1445	1450	1455	
Glu Glu Glu Val Glu Arg Asp Cys Lys Asp Glu Tyr Glu Gly Cys Glu			
55 1460	1465	1470	
Lys Glu Lys Asn Gly Lys Cys Val Thr Ala Cys Lys Ala Tyr Lys Glu			
1475	1480	1485	
Tyr Ile Thr Asn Lys Lys Glu Glu Tyr Asp Ser Gln Lys Gly Lys Phe			
1490	1495	1500	

Asp Val Glu Lys Thr Glu Lys Lys Gln Gly Tyr Glu Asp Tyr Ser Glu
 1505 1510 1515 1520
 Lys Gln Ala Ser Glu Tyr Leu Lys Glu Lys Cys Ile Lys Ser Ser Cys
 1525 1530 1535
 5 Asn Cys Met Lys Lys Val Thr Glu Ile Ser Asn Tyr Trp Thr Asn Pro
 1540 1545 1550
 His Lys Thr Tyr Asp Thr Glu Asn Leu Gly Ile Lys Cys Glu Cys Pro
 1555 1560 1565
 Pro Ser Pro Cys Thr Ile Val Asp Gly Ile Leu Ser Pro Gln Asn Ser
 10 1570 1575 1580
 Ser Ser Tyr Ala Glu Gly Cys Lys Trp Lys Tyr Gly Lys Met Ser Gln
 1585 1590 1595 1600
 Gly Gly Thr Glu Trp Asp Cys Ser Lys Lys Ser Gly Gly Glu Gly
 1605 1610 1615
 15 Asn Glu Asp Gly Asp Val Val Cys Ile Pro Pro Arg Arg Arg Arg Leu
 1620 1625 1630
 Tyr Val Lys Asn Leu Gln Asp Leu Thr Gly Glu Glu Ser Leu Val Asp
 1635 1640 1645
 Leu Arg Lys Ala Phe Ile Lys Cys Ala Ala Ile Glu Thr Phe Phe Ala
 20 1650 1655 1660
 Trp His Glu Phe Lys Lys Glu Lys Glu Arg Glu Glu Lys Glu Lys Asn
 1665 1670 1675 1680
 Glu Gln Asp Val Gln Tyr Lys Ser Ser Val Leu Glu Asn Leu Gln Lys
 1685 1690 1695
 25 Gln Leu Lys Asn Gly Glu Ile Asp Asp Glu Phe Lys Arg Gln Met Phe
 1700 1705 1710
 Tyr Thr Phe Ala Asp Tyr Arg Asp Ile Cys Leu Gly Lys Asp Ile Gly
 1715 1720 1725
 Asn Asp Val Asp Gly Ile Asn Glu Lys Ile Asp Thr Ile Leu Gln Lys
 30 1730 1735 1740
 Asn Gly Lys Pro Asn Asn Ile Glu Glu Tyr Lys Lys Trp Trp Gln Lys
 1745 1750 1755 1760
 His Gly His Glu Ile Trp Glu Gly Met Leu Cys Ala Leu Ser Tyr Asn
 1765 1770 1775
 35 Thr Glu Thr Lys Glu Met Asp Lys Glu Leu Arg Asn Lys Leu Thr Glu
 1780 1785 1790
 Gln Lys Asn Gly Asn Lys Asn Thr Tyr Asp Thr Val Thr Ile Ser Gly
 1795 1800 1805
 Gly Pro Ile Gly Asn Thr Lys Leu Glu Lys Phe Ala Ser Arg Pro Pro
 40 1810 1815 1820
 Phe Phe Arg Trp Leu Glu Glu Trp Ala Asp Glu Phe Cys Arg Lys Arg
 1825 1830 1835 1840
 Thr His Lys Leu Glu Lys Ile Gln Asn Glu Cys Lys Gly Val Ser Gly
 1845 1850 1855
 45 Thr Asn Gln Cys Asp Asp Asp Gly Phe Asp Cys Asp Glu Met Cys Pro
 1860 1865 1870
 Lys Lys Asp Gly Ser Phe Glu Thr Phe Lys Cys Leu Ser Cys Ala Lys
 1875 1880 1885
 Ser Cys Arg Phe Tyr Lys Lys Trp Ile Ser Arg Lys Lys Glu Glu Phe
 50 1890 1895 1900
 Asp Lys Gln Ser Lys Lys Tyr Glu Asn Glu Ile Asp Asp Val Lys His
 1905 1910 1915 1920
 Asn Ser Asp Asn Ile Tyr Gly Lys Asp Phe Leu Glu Thr Leu Asp Gln
 1925 1930 1935
 55 Gln Tyr Lys Ser Val Glu Leu Phe Leu Glu Lys Val Lys Gly Pro Cys
 1940 1945 1950
 Ser Ile Asn Asn Asn Glu Glu Cys Lys Ile Asp Phe Asn Lys Pro
 1955 1960 1965
 Lys Asp Thr Phe Gly His Ala Lys Asn Cys Gly Pro Cys Ser Glu Ile

	1970	1975	1980
	Arg Phe Lys Cys Ile Glu Asp Asn Ser Asn	Trp Val Thr Thr Asn Thr	
1985	1990	1995	2000
	Cys Asn Lys Thr Thr Phe Lys Phe Thr Glu Asp Asn Lys Asp Thr Lys		
5	2005	2010	2015
	Glu Asp Ser Glu Gln Leu Gly Met Leu Ile Ser Asp Asn Thr Val Gln		
	2020	2025	2030
	Asn Phe Ala Asp Gly Leu Gln Asn Asp Cys Lys Asp Ala Asp Ile Phe		
	2035	2040	2045
10	Lys Gly Leu Arg Lys Asp Gln Trp Ser Cys Gly Tyr Phe Cys Asn Leu		
	2050	2055	2060
	Asp Ile Cys Ser Leu Lys Thr Ser His Gly Glu Asn Asn Tyr Lys Gln		
	2065	2070	2075
	Asn Ile Leu Ile Arg Ala Leu Phe Lys Arg Trp Leu Glu His Phe Leu		
15	2085	2090	2095
	Glu Asp Tyr Asn Lys Ile Asn Asp Lys Ile Ser His Cys Met Lys Asn		
	2100	2105	2110
	Gly Glu Gly Ser Thr Cys Ile Lys Gly Cys Glu Ile Lys Cys Asn Cys		
	2115	2120	2125
20	Val Ser Asn Trp Ile Lys Lys Lys Thr Leu Glu Trp Glu Ile Val Arg		
	2130	2135	2140
	Asp Arg Phe Phe Lys Gln Tyr Asn Val Asp Ser Glu Lys Ser Phe Thr		
	2145	2150	2155
	Val Lys Ser Phe Leu Glu Gln Ala Pro Phe Asp Ser Asp Val Gln Lys		
25	2165	2170	2175
	Ala Ile Lys Pro Phe Glu Lys Leu Arg Asp Phe Glu Asp Ser Ile Val		
	2180	2185	2190
	Cys Asn Gly Thr Thr Ser Ala Arg Lys Glu Lys Gly Thr Glu Lys Asp		
	2195	2200	2205
30	Val Val Ile Cys Leu Leu Asp Lys Leu Gln Lys Gln Ile Glu Thr Cys		
	2210	2215	2220
	Gln Thr Lys His Lys Glu Thr Ser Gly Asn Thr Cys Ser Pro Pro Pro		
	2225	2230	2235
	Asn Pro Asp Thr Gln Thr Asp Thr Pro Leu Pro Leu Glu Ser Phe Pro		
35	2245	2250	2255
	Pro Pro Phe Cys Asn Val Pro Pro Asn Pro Cys Gly Asp Lys Asp Ala		
	2260	2265	2270
	Thr Asn Val Val Gly Val Glu Val Leu Ala Lys Glu Met Gln Glu Ala		
	2275	2280	2285
40	Ala His Lys Ser Met Leu Ser Arg Ser Ala Val Asp Ser Gly Lys Gly		
	2290	2295	2300
	Asp Lys Gly Glu Ser Ser Ser Gly Lys Ser Ser Leu Glu Gly Asp Ile		
	2305	2310	2315
	Ser Leu Ala Glu Phe Lys Asn Gly Phe Asn Pro Ser Gly Leu Lys Asn		
45	2325	2330	2335
	Val Cys Gln Ile Thr Glu Lys His Ser Tyr Ala Asn Gly Ala Ser Lys		
	2340	2345	2350
	Asp Pro Cys Asn Gly Lys Gly Asn Gly Lys Asp Gln Arg Phe Lys Ile		
	2355	2360	2365
50	Glu Thr Gln Trp Lys Asp Thr Gly Lys Ser Gly Lys His Val Asp Val		
	2370	2375	2380
	Tyr Leu Pro Pro Arg Arg Glu His Ile Cys Thr Ser Asn Leu Glu Tyr		
	2385	2390	2395
	Leu Leu Lys Gly Asn Ser Asp Gln Ile Met Lys Val Gly Asn Asn Lys		
55	2405	2410	2415
	Ile Asn His Ser Phe Leu Gly Glu Val Leu Leu Ala Ala Lys Tyr Glu		
	2420	2425	2430
	Ala Glu Phe Ile Lys Thr Asn Tyr Thr Arg Leu Asn Gly Gln Asn Asp		
	2435	2440	2445

Asn Gly Ala Lys Cys Arg Ala Met Lys Tyr Ser Phe Ala Asp Ile Gly
 2450 2455 2460
 Asp Ile Val Arg Gly Arg Asp Leu Trp Glu His Asn Asp Phe Lys Lys
 2465 2470 2475 2480
 5 Leu Glu Arg Asp Leu Val Lys Ile Phe Gly Lys Ile Lys Glu Gly Ile
 2485 2490 2495
 Thr Asp Glu Thr Thr Lys Lys Gln Tyr Glu Lys Asp Asp Thr Asp Asn
 2500 2505 2510
 Lys Gln Leu Arg Cys Asp Trp Trp Glu Ala Asn Arg Asp Gln Val Trp
 10 2515 2520 2525
 Glu Ala Met Gln Cys Lys Thr Thr Ile Pro Pro Val Thr Thr Ser Cys
 2530 2535 2540
 Asp Thr Thr Thr Val Thr Pro Leu Val Asp Tyr Ile Pro Gln Arg Leu
 2545 2550 2555 2560
 15 Arg Trp Met Met Glu Trp Ala Glu Trp Tyr Cys Lys Tyr Gln Ser Lys
 2565 2570 2575
 Ala Tyr Ser Glu Leu Arg Lys Gly Cys Glu Asp Cys Arg Ser Trp Lys
 2580 2585 2590
 Cys Met Lys Gly Asp Ser Lys Cys Glu Asn Cys Thr Lys Ala Cys Lys
 20 2595 2600 2605
 Asp Tyr Asn Ser Lys Ile Glu Pro Trp Lys Gln Gln Trp Thr Lys Ile
 2610 2615 2620
 Lys Glu Lys Tyr Glu Glu Leu Tyr Lys Lys Ala Gln Asn Ser Asp Thr
 2625 2630 2635 2640
 25 Ser Asn Ser Gly Thr Thr Tyr Pro Lys Asp Glu Lys Asp Val Val Ser
 2645 2650 2655
 Phe Leu Ser Lys Leu His Glu Lys Asn Lys Asp Asn Lys Ile Tyr Tyr
 2660 2665 2670
 Thr Ala Ala Gly Tyr Ile His Gln Gln Ala Lys Tyr Leu Asp Cys Thr
 30 2675 2680 2685
 Gln Gln Thr His Phe Cys Asp Lys Lys Asn Gly Glu Thr Leu Pro Ser
 2690 2695 2700
 Gly Arg Asp Asn Asp Lys Tyr Ala Phe Lys Lys Pro Pro Lys Lys Tyr
 2705 2710 2715 2720
 35 Glu Arg Ala Cys Lys Cys His Glu Lys Gln Glu Pro Pro Pro Pro Lys
 2725 2730 2735
 Val Pro Glu Asp Ser Glu Asp Asp Arg Glu Arg Ser Glu Pro Gly Glu
 2740 2745 2750
 Asp Ala Leu Pro Val Leu Pro Pro Glu Glu Ile Glu Gln Glu Glu Glu
 40 2755 2760 2765
 Pro Glu Glu Thr Ser Val Asp Thr Thr Gln Asp Glu Glu Glu Pro Ala
 2770 2775 2780
 Ser Glu Gly Gly Pro Ser Gly Ser Pro Thr Glu Glu Ser Gly Glu
 2785 2790 2795 2800
 45 Pro Arg Glu Asn Ser Asp Ser Ser Asp Pro Lys Pro Asp Gln Asn Pro
 2805 2810 2815
 Glu Ala Asn Pro Glu Gln Thr Pro Ile Leu Lys Pro Glu Glu Ala
 2820 2825 2830
 Pro Pro Lys Ser Lys Pro Pro Asp Gly Asp Arg Gly Val Gly Arg Ser
 50 2835 2840 2845
 Leu Gly Pro Thr Pro Arg Ser Glu Val Glu Pro Glu Glu Ser Glu Asn
 2850 2855 2860
 Glu Asp Val Glu Asp Glu Asp Asp Glu Glu Glu Glu Asp Pro Asp
 2865 2870 2875 2880
 55 Asp Asp Pro Glu Ala Glu Ser Glu Glu Asp Glu Asp His Gly Gly
 2885 2890 2895
 Gln Glu Ala Glu Ala Val Pro Pro Gln Pro Gln Ala Pro Ala Pro Leu
 2900 2905 2910
 Pro Pro Pro Pro Pro Leu Pro Pro Leu Lys Thr Ala Leu Met Ser

2915	2920	2925
Ser Thr Ile Met Trp Ser Val Gly Ile Gly Phe Ala Ala Ile Ser Tyr		
2930	2935	2940
Phe Leu Leu Lys Lys Lys Pro Lys Ser Pro Val Asp Leu Ile Arg Val		
5 2945	2950	2955
Ile Asp Ile His Lys Gly Asp Tyr Gly Ile Pro Thr Leu Glu Ser Lys		
2965	2970	2975
Asn Arg Tyr Ile Pro Tyr Val Ser Asp Thr Tyr Lys Gly Lys Thr Tyr		
2980	2985	2990
10 Ile Tyr Met Glu Gly Asp Thr Ser Gly Asp Glu Lys Tyr Gly Phe Met		
2995	3000	3005
Ser Asp Thr Thr Asp Ile Thr Ser Ser Glu Ser Glu Tyr Glu Glu Leu		
3010	3015	3020
Asp Ile Asn Asp Ile Tyr Val Pro Gly Ser Pro Lys Tyr Lys Thr Leu		
15 3025	3030	3035
Ile Glu Val Val Leu Glu Pro Ser Lys Ser Asn Gly Asn Thr Leu Gly		
3045	3050	3055
Asp Asp Met Val Pro Thr Thr Asn Thr Phe Thr Asp Glu Glu Trp Asn		
3060	3065	3070
20 Glu Leu Lys His Asp Phe Ile Ser Gln Tyr Ile Gln Ser Glu Pro Leu		
3075	3080	3085
Asn Val Pro Gln Tyr Asp Val Leu Lys Glu Leu Pro Met Asn Ile Val		
3090	3095	3100
Gly Asn Val Leu Asp Asp Gly Ile Asn Glu Lys Pro Phe Ile Thr Ser		
25 3105	3110	3115
Ile His Asp Arg Asp Leu Asn Ser Gly Glu Glu Ile Ser Tyr Asn Ile		
3125	3130	3135
Asn Met Ser Thr Asn Ser Met Asp Asp Pro Lys Tyr Val Ser Asn Asn		
3140	3145	3150
30 Val Tyr Ser Gly Ile Asp Leu Ile Asn Asp Ser Leu Ser Gly Gly Lys		
3155	3160	3165
Pro Ile Asp Ile Tyr Asp Glu Val Leu Lys Arg Lys Glu Asn Glu Leu		
3170	3175	3180
Phe Gly Thr Asn Tyr Lys Lys Asn Thr Ser Asn Asn Asn Val Ala Lys		
35 3185	3190	3195
Leu Thr Asn Ser Asp Pro Ile Met Asn Gln Leu Asp Leu Leu His Lys		
3205	3210	3215
Trp Leu Asp Arg His Arg Asp Met Cys Glu Met Trp Asn Asn Lys Glu		
3220	3225	3230
40 Glu Val Leu Asp Lys Leu Lys Glu Gln Trp Asn Lys Asp Asn Asp Gly		
3235	3240	3245
Gly Asp Ile Ser Ser Asp Ser Asn Lys Arg Leu Asn Thr Asp Val Ser		
3250	3255	3260
Ile Glu Ile Asp Met Asp Asp Pro Lys Gly Lys Lys Glu Phe Ser Asn		
45 3265	3270	3275
Met Asp Thr Ile Leu Asp Asn Ile Glu Asp Asp Ile Tyr Tyr Asp Val		
3285	3290	3295
Asn Asp Glu Asn Pro Ser Val Asn Asp Ile Pro Met Asp His Asn Lys		
3300	3305	3310
50 Val Asp Val Pro Lys Lys Val His Val Glu Met Lys Ile Leu Asn Asn		
3315	3320	3325
Thr Ser Thr Gly Ser Leu Glu Gln Gln Phe Pro Ile Ser Asp Val Trp		
3330	3335	3340
Asn Ile		
55 3345		

<212> DNA
 <213> Plasmodium falciparum

 <220>
 5 <221> gene
 <222> (0)...(0)
 <223> var gene PFD1235w codon optimised

 <400> 7
 10 gaattcgtcg acgccaccat gggcaacgcc tcctcctccg agggcgaggc caagacccc 60
 tccctgaccg agtcccacaa ctccgcccagg aacatctgg agggatacgc cgagtcac 120
 aaggagcagg cctccaagga cgccaagatc cacggacacc acctgaaggg cgacctggcc 180
 aaggccgtgt tcaggcaccc cttctccgccc tacaggccca actacggcaa cccctgcgag 240
 ctggactacc gttccacac caacgtgtgg cacaggaacg cggaggacag gaacccctgc 300
 15 ctgttctcca gggccaagcg cttctccaac gaggggaggg ccgagtgc 360
 atcaccggaa acaagggaga gtgcggcgcc tgccccc 420
 gactacaacc tgcaccacat caacgagaac aacatccgca acacccacga cctgctggc 480
 aacctgctgg ttagtggcccg ctccgaggg 540
 ggctacggca tctacaagtc cggcatctgc acctccctgg cccgctctt 600
 20 ggcgacatca tcaggggaa ggacctgtac aggaggact ccaggaccga caagctggag 660
 gagaacctgc gcaagatctt cgccaaacatc tacaaggagc tgaagaacgg caagaagtgg 720
 gccgaggcca aggagtaacta ccaggacgac ggcacccgca actactacaa gctgcgcgag 780
 gcctggtggg ccctgaacag gaaggatgtg tggaaaggccc tgacctgctc cgcccccagg 840
 gacgcccagt acttcatcaa gtcctctgtg cgcgaccaga cttctctaa cgactactgc 900
 25 ggccacggcg agcacgaagt gctgaccaac ctggactacg tgccccagg 960
 ttcgaggagt gggctgagga gttctgcgc atcaagaaga tcaagctgg caaaagtgaag 1020
 gaggcctgca gggacgactc caagaagctg tactgctccc acaacggcta cgactgcacc 1080
 aagaccatca ggaacaagga catcctgtcc gacaacccca agtgcacccg atgctccgt 1140
 aagtgc当地 aagtgc当地 tggctgc当地 aaccagagga acgagttcga gaagcagaag 1200
 30 aagaagtact acaaggagat ccagacctac accagcaagg acgctaagac cgactccaac 1260
 atcaacaacg agtactacaa ggagttctac gacaagctga agaacgagg 1320
 ctgaacaagt tcatcaagct gctgaacgag ggacgctact gcaaggagaa gatctccggc 1380
 gagcgc当地 tcgacttccac catgaccgg 1440
 tgccagatct gccc当地 gagtg cggctg 1500
 35 gtatccacc ccaactgca 1560
 gacatcaccg tgctgtactc cggcgac 1620
 ttctgcaacg acaagaacaa ggagaacgac gagaactacg agaagtggca 1680
 aagtctccg agatcaacaa gtgccagatg accccctctt cccacaaagt gccaagcac 1740
 ggctacatca tgc当地 tcttgc当地 gacctgtggg tgaagaac 1800
 40 tccatcaact ggaagaacga cctgaccaac tgc当地 tcaaca 1860
 aagaacgact gcaacaccaa ctgcaagtgc ttcgagaact gggctaa 1920
 gagtgaaga aagtcaagac catctacaag aacgagaacg gaaacaccaa 1980
 aagaagctga acaaccactt ccagg 2040
 gaggagaagt ggtacaagct gatggaggac ctg 2100
 45 aagaacggaa ccaaggactc tgagg 2160
 atcgccgagc gctgcatcga caacaactcc aaggactctt gccccccc 2220
 aagaccaacc ctgc当地 cca 2280
 gccc当地 tgc当地 gag 2340
 ctgaagg 2400
 50 gg 2460
 ggc当地 gca 2520
 tgc当地 agg 2580
 aacatcgtgc agaagaagaa 2640
 cagcacatgt gc当地 cctgg 2700
 ggatc当地 cctcc 2760
 55 cagaagatca tctgg 2820
 gaccc 2880
 cgc当地 agatctt 2940
 tacaccaacc gcg 3000

caccaggtgt ggagggccat gaagtgcgcc accaaggca tctccaacaa caactgcaac 3060
 ggcacccccca tcgaggacta catccccca aggtctgcgt ggtatgaccga gtggggcag 3120
 tggtaactgca agaaggcagtc ccaggagtac gagaagctgg aggagaagtg cggaatgtgc 3180
 accggcaagg gccaggggcga cggcaaggac tgcaccaga aggacaaggaa gtgctccct 3240
 5 tgcaagaagg cctgcgacgc ctacaagaag gagatcgaga agtgggagaa gcagtggaaa 3300
 accgtgtccg ccatctacca gatcctgtac gccaaggcca ggatcgtggc ctccaaacgga 3360
 ggaccggct actacaacac cgaagtgcag aagaaggacc gotccgtgt cgacttcctg 3420
 tacgagctgc acctgcagaa cggcggaaag aaggggccctc cccctgcccac ccacccttac 3480
 aagtctgtga acacccgcga caagagggac gcccacatcg gcgactgcaa ggagcagcac 3600
 10 tccaccgcg ctggctacgt gcaccaggag aagtacgcct tcaagaacccc ccccaacgtg 3660
 gtgttctgcg acaacaacgg caacaaggag gaggccctc ccccccctac cacccttcc 3720
 tacgtggagg ctgcaagtgc catgaccagg gtcacacca tcaagaccgt gaccgacgtg 3780
 acccctaacc cctgcgcccga gaccggcggaa gccaagatcc tgcagggaga ggctaaccgag 3840
 15 gacaaggacg agagcaagct gaagggaaag gccgaggagg gagactactc caggggagga 3900
 accccttcg acttcaacaa caacctgtgc ggcacccatcg agaagcactc caacgcccac 3960
 aacgactccc agcagccctg ctacggcaag gaccagaagc gttcaacagt gggaaaccgag 4020
 tggtccttca aggacaacca ccgcaagagg acccaccctg aggccctacat gccccttagg 4080
 agggagcaca tctgcacccca taacctggag tacctgatcc acaagcgc当地 gaagcccatc 4140
 20 atcgaggcg accccaaacaa gatcatccac agcctgctgg gcgcacgtgt gctggctgct 4200
 aagtacgagg ctgagaacat caagaagctg tacgaggaga acaacaacag gaaggaccag 4260
 gagggcatct gccgcgcccgt gaagtacagc ttgcgtgaca tcggagacat catcaggggc 4320
 aaggacatgt ggatcgagaa caacgacgt aagcgcctgc agaccaacact gaaggagatc 4380
 ttccaccaaga tcaaggaaaa gaccggcggc accacccatcg acgaggacaa cgacccttac 4440
 25 ctgaagctga gggctgactg gtggggaggct aaccgcgcta aagtgtggaa ggctatgaag 4500
 tgcaagacca acggcggtgca catcacctgc gactctgacc acaccctct ggacgactac 4560
 atccctcagc gcctgcgtg gatgaccgg cggactgtgatggactgtgca ggactacatc ggcccgagc 4620
 caggagataca agaagctcgaa ggagaagtgc tcccagtgc agttcaaggg caagggcgg 4680
 aacgagtgc accgcgagac caaggagtgc aacgactgca agcaggctt cgaggagatc 4740
 30 aagcgaaga tcaagacotg ggccgaccag tggaaagtga tcagcaacaa gtacgaggac 4800
 ctgtacaaga aggcccagaa ccctaccaac gccgtgtga aggacaacaa ggacgagaag 4860
 gacaagaacg tgatcgactt cctgaccggc ctgcagaagg ccaacaacgg cgaaaagacc 4920
 ggagtgcaca ccgtgtacag caccgctgcc ggatacatcc accaggaggc taggaccagg 4980
 gagtgccagg agcagaggaa gttctgcgac aagaagaacg gcatcgaccaa caccagctac 5040
 35 gcttcaagg acccccttcac cggctacgccc accgcctgcg actgcataa ccgcctccag 5100
 accgaggaggc ccaagaagaa ggaggagaac gtggagtccg cttgcaagat cgtggaggaa 5160
 gtgctgtcca agccttaggaa caagaccacc ggcggcatcg accactgcaa ccctaagtac 5220
 taccctccca aggagaacta ccctggctgg aactgcaccc ccggacagtt caagtccggc 5280
 cacgcggagg cctgcacccca tcccaggagg atcaagctgt gctgtatcaa cctgcagttac 5340
 40 ctgaacgaga agaagtcccc cgaggagctg aggaaggct tcatccatgt cgccgc当地 5400
 gagaccaact ggctgtggca gaagtacaag aaggacaaga acggcggcgt ggcccgaggcc 5460
 aagctgaact ccggaaaccat ccccgacgac ttcaagcgcc agatgttcta cacccctggc 5520
 gactacaggc acctgtgcct ggacaccggc atctccctcta aggccgacac ctccaccgg 5580
 gtggaaaag tgaagatcaa catcgacagg gtgttccaga agatcgacat caccacgtg 5640
 45 gagcagagga agccttgggt gggaaaagaaac gctgaggcca tctggacgg catgtgtgc 5700
 gcccgtccct acaacaccac caacaagaac atggactaca acgctcacac caagctgaac 5760
 cccacctaagc gctacaacgc catcaagtcc gagctggagg acttcgtgaa ccgcctccag 5820
 ttccctgcgt gtgttccatcg gttccatcgatggaggccatcgacttccatcgatccatcg 5880
 aaggagctgg agaccaagtgc caacgactgc accgtgtccg agtccggcact cttccacgt 5940
 50 accggcaaca agacctgcga cgacaaggac aagtgcgacg agtcaagcg cgcctgcacc 6000
 acctacaaagc cttggctgaa gaactggaaa acccagtaca agacccagtc caagaagtac 6060
 ttgcacgaca agagggaggaa gctgtacaag tccatcgacg acgtggccctc ctccaccctc 6120
 gcctaccaat acctgcacgc ccagctgaag aagctgtgc gaaacggca ctgcaagtgc 6180
 atggacggcg agtccaaggaa gaccaccggc cagccccaca actccacatc ctccacatcg 6240
 55 cccgcctccc tggacgacga gcccggaggaa gtgaacggaa agtcaactg caaagtgaag 6300
 cacaggcctc agccccccctt ggcctgccc cttccctgccc cttccggccc tccccccgag 6360
 gaccagatcg agcacgacaa cagggggccgc tccgaggggg gcgaccaggcc cctctgccc 6420
 gcccggcctc cccctcccccc tcaggccgc cagccccccca agcccaagcc caagaggacc 6480
 ggcgaggggcc tggcgaggaa cctgccccctt gccgacagga acaccaacccctt gctgtactcc 6540

gaggaggagg acgacgagga cgacgacgaa gtgcaggagg aggaggagac cccccctct 6600
 gaggctgagg agggcgaggg ccacgtggag accgaggagg agaccaagcc cgtgaaggaa 6660
 aagaccgagg gagccggagc caccgaagtg accaagcagg gctccgcccc taccgccacc 6720
 acccctaccg tggaggacat ctgcgccacc gtggccaagg ctctgaaggg agacaagtcc 6780
 5 ctgaacgccc cctgcgtct gaagtacgga aagaacaact cccgcctggg ctggaaagtgc 6840
 atccccaccc cccggcgacaa gaccgacacc tctgagaacg gagccccccag gaggccccgc 6900
 tctgcccacg gcggcaagtgcgactccgag aaggatcca tctgcgtgcc ccctcgcagg 6960
 cgcaggctgt acatcaagaa gatcgtggac tggcccgagt cccagtctaa gaccgtgacc 7020
 tccgtgaacg gcgacggcaa cggctcccag gaagtgtgt ctgtgaacgg cgcctccgag 7080
 10 tctggcggt cccggatccgg caccgagtct caggcctccg acgtgtccca gggcaacgg 7140
 gcctccaccc ccccacaggt ggcctgtct caccgcctcg tgaagtctgc tgctatcgag 7200
 accttcttcg cctggcacaa gtacaaagtg gacaaggaga tggaggagaa ggagaagcag 7260
 gccgctcaga accacacttgt gcagcgcaag acctccgaga acccccagaa gaagctggag 7320
 ggcggagaga tccctgagga cttcaagagg cagatgttct acaccctggg agactaccgc 7380
 15 gacatcctgg tcggtgacaa gaccatgatc gaggctctgg agaagtccgg agacaccaag 7440
 atcgaggaca tctccgagaa gatccctaag atcctggacg gcgagaacaa caagccgct 7500
 ggcggcgac ccaaggcagcc caactccgga aagaccctc aggagtggg gaaggagaac 7560
 gccaaggcaca tctggcacgg aatgatctgc gctctgaccc acaacaccga ctccaaacggc 7620
 aaggacaaga agatccagca ggtgaaggcc accgacaaca ccgacactgt ccagaagctg 7680
 20 aagaaggaca acgactacga gaccgtgtct ttcgaggcct cccggcacccg cgccaaagtct 7740
 aacgacgaca ccaagctgaa gaacttcgtg gtgcgcctca cctacttcgg ctggctggag 7800
 gagtggggag aggagttctg caggaaggcag aagcacaacg tgcacatcat caagaaggac 7860
 tgccgcgaca acaagttctg ctctggcgc ggcctgcgt ggcacggagaa agtggccgac 7920
 aagaaggaca tcttcaagca cttcgactgc ccctcctcg ccaggcactg ccgctcctac 7980
 25 cgcaagtggc tcgagcgcaa gaaaaccggag tacgagaacg aggagtccgc ctactccaag 8040
 cagaagtcca actacgtgaa cggctccaaac ggcgacggag gcaacaacaa cgacaaggag 8100
 ttctacacca agctggagac ctgcaccaag gccaccaact tccctggagtc tctgaagggc 8160
 cagtgcacatcg gaaacaacaa cggaggaacc gacatcaagt tctccaacac caacatcacc 8220
 ttccggctccg ctgaggactg caaggcctgc tccgagttca aagtgaactg cgagaacgg 8280
 30 tcctgcggct ccgctaagca gaaggactgc cctaacaaca ccatcaccc ccagaacatc 8340
 aagggcctga ccgaccagg ggacatgcgc gtgtctgaca acaccggatc cggcttcgag 8400
 ggagacctgg gaatctgcca gggcgctggc atcttcaagg gcatccgcaa ggacggatgg 8460
 aagtgcggag acttctgogg aatcgacatc tgcacccctgg aaaagaccaa caacggaaag 8520
 gagtctgaca agaaatacat catcatgaag gagttctgtg agcgctggct ggagttacttc 8580
 35 ttccggact acaaccgcat ccagaagaag ctcaagaccc gcaaggagaaa cggcaaggggc 8640
 tccacactgca tccgcctctt cgtggacgg tggatcaacg tgaagaaggaa cgagtggcag 8700
 aagatcaact ccaactactt ggaccagaac accaaggaga accccggggg caacaacctg 8760
 tcctccttcc tggaggacgg cccttcaag aacgaagtgg acaaggccat caagccctgc 8820
 ggcacactga ccgacttcaa gaagtccaa aagtgcacg gaacctcccg ctccggcaac 8880
 40 tctgaggagt ccaccaagta cgacggcgtg atctgcctgc tggacaacct gaagaacatc 8940
 atcaagaccc ggcagaacgt gcctccggaa aagcctgaca ccccttgcac gaagtcccct 9000
 gccccctgg ggcacgacca cgcacccctg gaggaggaga accctgtgac ccagcccaac 9060
 atctgcccccc agacctccgt ggaggagaag aagaaggagg aggaagaaaa gtgcgtgaa 9120
 aaggaagagg aagaggaaaa ggaagaagag aaggacaagg gagatgagga agtgaaggag 9180
 45 gagaaaagg acaaggggca cgaagaggaa gaagccgagg aggagggaaa agaggaagag 9240
 gagaccgact cccacatcta cgaggactac tccgacagcg acgcccggag ggacgacgag 9300
 gacgaggccg tgaccgagtc tctgtccct tctgagttccc agccaaagag gctgctgagg 9360
 gagttccctt cccctgagct gaagaacgccc atgctttctt ccaccatcct gtggatggtc 9420
 ggtatcggt tcgcccgcctt cacctacttc ttccctgaagt aataagcggc cgc 9473

50

<210> 8
 <211> 3147

55 <212> PRT
 <213> Plasmodium falciparum

<220>
 <221> UNSURE

<222> (O)...(0)

<400> 8
 Met Gly Asn Ala Ser Ser Ser Glu Gly Glu Ala Lys Thr Pro Ser Leu
 5 1 5 10 15
 Thr Glu Ser His Asn Ser Ala Arg Asn Ile Leu Glu Gly Tyr Ala Glu
 20 25 30
 Ser Ile Lys Glu Gln Ala Ser Lys Asp Ala Lys Ile His Gly His His
 35 40 45
 10 Leu Lys Gly Asp Leu Ala Lys Ala Val Phe Arg His Pro Phe Ser Ala
 50 55 60
 Tyr Arg Pro Asn Tyr Gly Asn Pro Cys Glu Leu Asp Tyr Arg Phe His
 65 70 75 80
 Thr Asn Val Trp His Arg Asn Ala Glu Asp Arg Asn Pro Cys Leu Phe
 15 85 90 95
 Ser Arg Ala Lys Arg Phe Ser Asn Glu Gly Glu Ala Glu Cys Asn Gly
 100 105 110
 Gly Ile Ile Thr Gly Asn Lys Gly Glu Cys Gly Ala Cys Ala Pro Tyr
 115 120 125
 20 Arg Arg Arg His Ile Cys Asp Tyr Asn Leu His His Ile Asn Glu Asn
 130 135 140
 Asn Ile Arg Asn Thr His Asp Leu Leu Gly Asn Leu Leu Val Met Ala
 145 150 155 160
 Arg Ser Glu Gly Glu Ser Ile Val Lys Ser His Glu Tyr Thr Gly Tyr
 25 165 170 175
 Gly Ile Tyr Lys Ser Gly Ile Cys Thr Ser Leu Ala Arg Ser Phe Ala
 180 185 190
 Asp Ile Gly Asp Ile Ile Arg Gly Lys Asp Leu Tyr Arg Arg Asp Ser
 195 200 205
 30 Arg Thr Asp Lys Leu Glu Glu Asn Leu Arg Lys Ile Phe Ala Asn Ile
 210 215 220
 Tyr Lys Glu Leu Lys Asn Gly Lys Lys Trp Ala Glu Ala Lys Glu Tyr
 225 230 235 240
 Tyr Gln Asp Asp Gly Thr Gly Asn Tyr Tyr Lys Leu Arg Glu Ala Trp
 35 245 250 255
 Trp Ala Leu Asn Arg Lys Asp Val Trp Lys Ala Leu Thr Cys Ser Ala
 260 265 270
 Pro Arg Asp Ala Gln Tyr Phe Ile Lys Ser Ser Val Arg Asp Gln Thr
 275 280 285
 40 Phe Ser Asn Asp Tyr Cys Gly His Gly Glu His Glu Val Leu Thr Asn
 290 295 300
 Leu Asp Tyr Val Pro Gln Phe Leu Arg Trp Phe Glu Glu Trp Ala Glu
 305 310 315 320
 Glu Phe Cys Arg Ile Lys Lys Ile Lys Leu Gly Lys Val Lys Glu Ala
 45 325 330 335
 Cys Arg Asp Asp Ser Lys Lys Leu Tyr Cys Ser His Asn Gly Tyr Asp
 340 345 350
 Cys Thr Lys Thr Ile Arg Asn Lys Asp Ile Leu Ser Asp Asn Pro Lys
 355 360 365
 50 Cys Thr Gly Cys Ser Val Lys Cys Lys Val Tyr Glu Leu Trp Leu Arg
 370 375 380
 Asn Gln Arg Asn Glu Phe Glu Lys Gln Lys Lys Lys Tyr Tyr Lys Glu
 385 390 395 400
 Ile Gln Thr Tyr Thr Ser Lys Asp Ala Lys Thr Asp Ser Asn Ile Asn
 55 405 410 415
 Asn Glu Tyr Tyr Lys Glu Phe Tyr Asp Lys Leu Lys Asn Glu Gly Tyr
 420 425 430
 Glu Thr Leu Asn Lys Phe Ile Lys Leu Leu Asn Glu Gly Arg Tyr Cys
 435 440 445

Lys Glu Lys Ile Ser Gly Glu Arg Asn Ile Asp Phe Thr Met Thr Gly
 450 455 460
 Asp Lys Asp Ala Phe Tyr Arg Ser Asp Tyr Cys Gln Ile Cys Pro Glu
 465 470 475 480
 5 Cys Gly Val Gln Cys Ser Gly Thr Thr Cys Thr Pro Lys Lys Val Ile
 485 490 495
 His Pro Asn Cys Lys Asp Lys Glu Thr Tyr Glu Pro Gly Asp Ala Lys
 500 505 510
 Thr Thr Asp Ile Thr Val Leu Tyr Ser Gly Asp Glu Glu Gly Asp Ile
 10 515 520 525
 Ala Gln Lys Leu Gln Asp Phe Cys Asn Asp Lys Asn Lys Glu Asn Asp
 530 535 540
 Glu Asn Tyr Glu Lys Trp Gln Cys Tyr Tyr Lys Ser Ser Glu Ile Asn
 545 550 555 560
 15 Lys Cys Gln Met Thr Pro Ser Ser His Lys Val Pro Lys His Gly Tyr
 565 570 575
 Ile Met Ser Phe Tyr Ala Phe Phe Asp Leu Trp Val Lys Asn Leu Leu
 580 585 590
 Ile Asp Ser Ile Asn Trp Lys Asn Asp Leu Thr Asn Cys Ile Asn Asn
 20 595 600 605
 Thr Asn Val Thr Asp Cys Lys Asn Asp Cys Asn Thr Asn Cys Lys Cys
 610 615 620
 Phe Glu Asn Trp Ala Lys Thr Lys Glu Asn Glu Trp Lys Lys Val Lys
 625 630 635 640
 25 Thr Ile Tyr Lys Asn Glu Asn Gly Asn Thr Asn Asn Tyr Tyr Lys Lys
 645 650 655
 Leu Asn Asn His Phe Gln Gly Tyr Phe Phe His Val Met Lys Glu Leu
 660 665 670
 Asn Lys Glu Glu Lys Trp Tyr Lys Leu Met Glu Asp Leu Lys Glu Lys
 30 675 680 685
 Ile Asp Ser Ser Asn Leu Lys Asn Gly Thr Lys Asp Ser Glu Gly Ala
 690 695 700
 Ile Lys Val Leu Phe Asp His Leu Lys Asp Ile Ala Glu Arg Cys Ile
 705 710 715 720
 35 Asp Asn Asn Ser Lys Asp Ser Cys Pro Pro Ser Val Asp Thr Lys Thr
 725 730 735
 Asn Pro Cys Ala Lys Pro Pro Gly Ser Lys Pro Thr Lys Ser Val Lys
 740 745 750
 Gln Leu Ala Glu His Met Gln Gln Lys Ala Gln Lys Leu Leu Gly Thr
 40 755 760 765
 Arg Gly Gly Glu Ser Lys Leu Lys Gly Asp Ala Thr Arg Gly Thr Tyr
 770 775 780
 Asn Leu Gly Gly Gln Gly Asn Thr Leu Asn Gly Asp Ile Cys Lys Ile
 785 790 795 800
 45 Thr Lys Asn His Thr Asn Asp Ser Arg Pro Asn Gly Glu Pro Cys Thr
 805 810 815
 Gly Lys Asp Lys Val Lys Asn Gly Phe Arg Leu Lys Ile Gly Thr Pro
 820 825 830
 50 Trp Thr Asn Ile Val Gln Lys Lys Lys Lys Ser Tyr Lys Asp Phe
 835 840 845
 Tyr Leu Pro Pro Arg Arg Gln His Met Cys Thr Ser Asn Leu Glu Asn
 850 855 860
 Leu Ser Thr Ser Ser Lys Gly Leu Ser Asn Gly Ser Phe Ala Ser His
 865 870 875 880
 55 Ser Leu Leu Gly Asp Val Leu Leu Ala Ala Lys Phe Glu Ala Gln Lys
 885 890 895
 Ile Ile Leu Val Tyr Lys Asn Lys Asn Asn Ile Asn Ile Arg Lys Arg
 900 905 910
 Ile Thr Asp Pro Asn Asp Gln Ala Thr Val Cys Arg Ala Ile Arg Tyr

915	920	925	
Ser Phe Ala Asp Leu Gly Asp Ile Ile Arg Gly Lys Asp Met Trp Asn			
930	935	940	
Ile Asn Ser Asp Ala Lys Asp Leu Gln Asp Arg Leu Glu Lys Ile Phe			
5 945	950	955	960
Lys Thr Ile Asn Glu Lys Leu Pro Asn Glu Ile Gln Lys Arg Tyr Thr			
965	970	975	
Asn Arg Glu Asn Lys His Leu Asp Leu Arg Ser Asp Trp Trp Glu Ala			
980	985	990	
10 Asn Arg His Gln Val Trp Arg Ala Met Lys Cys Ala Thr Lys Gly Ile			
995	1000	1005	
Ser Asn Asn Asn Cys Asn Gly Ile Pro Ile Glu Asp Tyr Ile Pro Gln			
1010	1015	1020	
Arg Leu Arg Trp Met Thr Glu Trp Ala Glu Trp Tyr Cys Lys Lys Gln			
15 1025	1030	1035	1040
Ser Gln Glu Tyr Glu Lys Leu Glu Lys Cys Gly Met Cys Thr Gly			
1045	1050	1055	
Lys Gly Gln Gly Asp Gly Lys Asp Cys Thr Gln Lys Asp Lys Glu Cys			
1060	1065	1070	
20 Ser Pro Cys Lys Lys Ala Cys Asp Ala Tyr Lys Lys Glu Ile Glu Lys			
1075	1080	1085	
Trp Glu Lys Gln Trp Lys Thr Val Ser Ala Ile Tyr Gln Ile Leu Tyr			
1090	1095	1100	
Ala Lys Ala Arg Ile Val Ala Ser Asn Gly Gly Pro Gly Tyr Tyr Asn			
25 1105	1110	1115	1120
Thr Glu Val Gln Lys Lys Asp Arg Ser Val Tyr Asp Phe Leu Tyr Glu			
1125	1130	1135	
Leu His Leu Gln Asn Gly Gly Lys Lys Gly Pro Pro Pro Ala Thr His			
1140	1145	1150	
30 Pro Tyr Lys Ser Val Asn Thr Arg Asp Lys Arg Asp Ala Thr Asp Asp			
1155	1160	1165	
Thr Thr Pro Thr Val Tyr Ser Thr Ala Ala Gly Tyr Val His Gln Glu			
1170	1175	1180	
Ala His Ile Gly Asp Cys Lys Glu Gln His Val Phe Cys Asp Asn Asn			
35 1185	1190	1195	1200
Gly Asn Lys Glu Lys Tyr Ala Phe Lys Asn Pro Pro Asn Val Tyr Val			
1205	1210	1215	
Glu Ala Cys Lys Cys Met Thr Arg Glu Ala Pro Pro Pro Thr Thr			
1220	1225	1230	
40 Pro Ser Thr Pro Asn Pro Cys Ala Glu Thr Gly Val His Thr Ile			
1235	1240	1245	
Lys Thr Val Thr Asp Val Ala Lys Ile Leu Gln Gly Glu Ala Asn Glu			
1250	1255	1260	
Thr Met Leu Lys Asn Ser Ser Asn Gly Asn Asp Lys Asp Glu Ser Lys			
45 1265	1270	1275	1280
Leu Lys Gly Lys Ala Glu Glu Gly Asp Tyr Ser Arg Gly Gly Thr Pro			
1285	1290	1295	
Ser Asp Phe Asn Asn Asn Leu Cys Gly Ile Thr Gln Lys His Ser Asn			
1300	1305	1310	
50 Ala His Asn Asp Ser Gln Gln Pro Cys Tyr Gly Lys Asp Gln Lys Arg			
1315	1320	1325	
Phe Asn Val Gly Thr Glu Trp Ser Phe Lys Asp Asn His Arg Lys Arg			
1330	1335	1340	
Thr His Pro Glu Ala Tyr Met Pro Pro Arg Arg Glu His Ile Cys Thr			
55 1345	1350	1355	1360
Ser Asn Leu Glu Tyr Leu Ile His Lys Arg Lys Lys Pro Ile Ile Glu			
1365	1370	1375	
Gly Asp Pro Asn Lys Ile Ile His Ser Leu Leu Gly Asp Val Leu Leu			
1380	1385	1390	

Ala Ala Lys Tyr Glu Ala Glu Asn Ile Lys Lys Leu Tyr Glu Glu Asn
 1395 1400 1405
 Asn Asn Arg Lys Asp Gln Glu Gly Ile Cys Arg Ala Met Lys Tyr Ser
 1410 1415 1420
 5 Phe Ala Asp Ile Gly Asp Ile Ile Arg Gly Lys Asp Met Trp Ile Glu
 1425 1430 1435 1440
 Asn Asn Asp Ala Lys Arg Leu Gln Thr Asn Leu Lys Glu Ile Phe Thr
 1445 1450 1455
 Lys Ile Lys Glu Lys Thr Gly Thr Tyr Asn Glu Asp Asn Asp
 10 1460 1465 1470
 Pro Tyr Leu Lys Leu Arg Ala Asp Trp Trp Glu Ala Asn Arg Ala Lys
 1475 1480 1485
 Val Trp Lys Ala Met Lys Cys Lys Thr Asn Gly Val Asp Ile Thr Cys
 1490 1495 1500
 15 Asp Ser Asp His Thr Pro Leu Asp Asp Tyr Ile Pro Gln Arg Leu Arg
 1505 1510 1515 1520
 Trp Met Thr Glu Trp Ala Glu Trp Tyr Cys Lys Ala Gln Ser Gln Glu
 1525 1530 1535
 Tyr Lys Lys Leu Glu Glu Lys Cys Ser Gln Cys Lys Ser Lys Gly Lys
 20 1540 1545 1550
 Gly Gly Asn Glu Cys Tyr Arg Glu Thr Lys Glu Cys Asn Asp Cys Lys
 1555 1560 1565
 Gln Ala Cys Glu Glu Tyr Lys Arg Lys Ile Lys Thr Trp Ala Asp Gln
 1570 1575 1580
 25 Trp Lys Val Ile Ser Asn Lys Tyr Glu Asp Leu Tyr Lys Lys Ala Gln
 1585 1590 1595 1600
 Asn Pro Thr Asn Ala Val Leu Lys Asp Asn Lys Asp Glu Lys Asp Lys
 1605 1610 1615
 Asn Val Ile Asp Phe Leu Thr Gln Leu Gln Lys Ala Asn Asn Gly Glu
 30 1620 1625 1630
 Lys Thr Gly Val His Thr Val Tyr Ser Thr Ala Ala Gly Tyr Ile His
 1635 1640 1645
 Gln Glu Ala Arg Thr Arg Glu Cys Gln Glu Gln Arg Glu Phe Cys Asp
 1650 1655 1660
 35 Lys Lys Asn Gly Ile Asp Asn Thr Ser Tyr Ala Phe Lys Asp Pro Pro
 1665 1670 1675 1680
 His Gly Tyr Ala Thr Ala Cys Asp Cys Ile Asn Arg Ser Gln Thr Glu
 1685 1690 1695
 Glu Pro Lys Lys Glu Glu Asn Val Glu Ser Ala Cys Lys Ile Val
 40 1700 1705 1710
 Glu Glu Val Leu Ser Lys Pro Arg Asp Lys Thr Thr Gly Gly Ile Asp
 1715 1720 1725
 His Cys Asn Pro Lys Tyr Tyr Pro Arg Lys Glu Asn Tyr Pro Gly Trp
 1730 1735 1740
 45 Asn Cys Thr Pro Gly Gln Phe Lys Ser Gly His Ala Gly Ala Cys Met
 1745 1750 1755 1760
 Pro Pro Arg Arg Ile Lys Leu Cys Val Ile Asn Leu Gln Tyr Leu Asn
 1765 1770 1775
 Glu Lys Lys Ser Pro Glu Glu Leu Arg Lys Ala Phe Ile Gln Cys Ala
 50 1780 1785 1790
 Ala Ile Glu Thr Tyr Trp Leu Trp Gln Lys Tyr Lys Lys Asp Lys Asn
 1795 1800 1805
 Gly Gly Val Ala Gln Ala Lys Leu Asn Ser Gly Thr Ile Pro Asp Asp
 1810 1815 1820
 55 Phe Lys Arg Gln Met Phe Tyr Thr Phe Gly Asp Tyr Arg Asp Leu Cys
 1825 1830 1835 1840
 Leu Asp Thr Asp Ile Ser Ser Lys Ala Asp Thr Ser Thr Gly Val Gly
 1845 1850 1855
 Lys Val Lys Ile Asn Ile Asp Ser Val Phe Gln Lys Ile Asp Ile Thr

	1860	1865	1870
	Asn Val Glu Gln Arg Lys Pro Trp Trp Gly Lys Asn Ala Glu Ala Ile		
	1875	1880	1885
	Trp Asp Gly Met Leu Cys Ala Leu Ser Tyr Asn Thr Thr Asn Lys Asn		
5	1890	1895	1900
	Met Asp Tyr Asn Ala His Thr Lys Leu Asn Pro Thr Tyr Gly Tyr Asn		
	1905	1910	1915
	Ala Ile Lys Ser Glu Leu Asp Phe Val Asn Arg Pro Gln Phe Leu		
	1925	1930	1935
10	Arg Trp Phe Thr Glu Trp Ser Asp Glu Phe Cys Thr Glu Arg Ser Ile		
	1940	1945	1950
	Lys Ile Lys Glu Leu Glu Thr Lys Cys Asn Asp Cys Thr Val Ser Glu		
	1955	1960	1965
	Ser Gly Thr Ser Asp Ala Thr Gly Asn Lys Thr Cys Asp Asp Lys Asp		
15	1970	1975	1980
	Lys Cys Asp Glu Cys Lys Arg Ala Cys Thr Thr Tyr Lys Thr Trp Leu		
	1985	1990	1995
	Lys Asn Trp Lys Thr Gln Tyr Lys Thr Gln Ser Lys Lys Tyr Phe Asp		
	2005	2010	2015
20	Asp Lys Arg Lys Glu Leu Tyr Lys Ser Ile Asp Asp Val Ala Ser Ser		
	2020	2025	2030
	Thr Gln Ala Tyr Gln Tyr Leu His Ala Gln Leu Lys Lys Leu Cys Gly		
	2035	2040	2045
	Asn Ala Asp Cys Lys Cys Met Asp Gly Glu Ser Lys Glu Thr Thr Gly		
25	2050	2055	2060
	Gln Pro Asp Asn Ser His Asp Ser His Met Pro Ala Ser Leu Asp Asp		
	2065	2070	2075
	Glu Pro Glu Glu Val Asn Gly Lys Cys Asn Cys Lys Val Lys His Arg		
	2085	2090	2095
30	Pro Gln Pro Pro Leu Ala Leu Pro Pro Pro Ala Pro Ser Gly Pro Pro		
	2100	2105	2110
	Ala Glu Asp Gln Ile Glu His Asp Asn Arg Gly Arg Ser Glu Arg Gly		
	2115	2120	2125
	Asp Gln Gly Pro Leu Pro Ala Arg Pro Pro Pro Pro Pro Gln Ala Ala		
35	2130	2135	2140
	Gln Pro Pro Gln Pro Lys Pro Lys Arg Thr Gly Glu Gly Leu Gly Arg		
	2145	2150	2155
	Asn Leu Pro Pro Ala Asp Arg Asn Thr Asn Leu Ser Asp Ser Glu Glu		
	2165	2170	2175
40	Glu Asp Asp Glu Asp Asp Asp Glu Val Gln Glu Glu Glu Glu Thr Pro		
	2180	2185	2190
	Pro Ser Glu Ala Glu Glu Gly Glu Gly His Val Glu Thr Glu Glu Glu		
	2195	2200	2205
	Thr Lys Pro Val Lys Glu Lys Thr Glu Gly Ala Gly Ala Thr Glu Val		
45	2210	2215	2220
	Thr Lys Gln Gly Ser Ala Pro Thr Ala Thr Thr Pro Thr Val Glu Asp		
	2225	2230	2235
	Ile Cys Ala Thr Val Ala Lys Ala Leu Lys Gly Asp Lys Ser Leu Asn		
	2245	2250	2255
50	Ala Ala Cys Ala Leu Lys Tyr Gly Lys Asn Asn Ser Arg Leu Gly Trp		
	2260	2265	2270
	Lys Cys Ile Pro Thr Ser Gly Asp Lys Thr Asp Thr Ser Glu Asn Gly		
	2275	2280	2285
	Ala Pro Arg Arg Ala Arg Ser Ala His Gly Gly Lys Ser Asp Ser Glu		
55	2290	2295	2300
	Lys Gly Ser Ile Cys Val Pro Pro Arg Arg Arg Arg Leu Tyr Ile Lys		
	2305	2310	2315
	Lys Ile Val Asp Trp Ala Glu Ser Gln Ser Lys Thr Val Thr Ser Val		
	2325	2330	2335

Asn Gly Asp Gly Asn Gly Ser Gln Glu Val Val Ser Val Asn Gly Ala
 2340 2345 2350
 Ser Glu Ser Gly Gly Ser Gly Ser Gly Thr Glu Ser Gln Ala Ser Asp
 2355 2360 2365
 5 Val Ser Gln Gly Asn Gly Ala Ser Thr Ser Pro Gln Val Ala Leu Leu
 2370 2375 2380
 His Ala Phe Val Lys Ser Ala Ala Ile Glu Thr Phe Phe Ala Trp His
 2385 2390 2395 2400
 Lys Tyr Lys Val Asp Lys Glu Ile Glu Glu Lys Glu Lys Gln Ala Ala
 10 2405 2410 2415
 Gln Asn His Leu Val Gln Arg Lys Thr Ser Glu Asn Pro Gln Lys Lys
 2420 2425 2430
 Leu Glu Gly Glu Ile Pro Glu Asp Phe Lys Arg Gln Met Phe Tyr
 2435 2440 2445
 15 Thr Leu Gly Asp Tyr Arg Asp Ile Leu Val Gly Asp Lys Thr Met Ile
 2450 2455 2460
 Glu Ala Leu Glu Lys Ser Gly Asp Thr Lys Ile Glu Asp Ile Ser Glu
 2465 2470 2475 2480
 Lys Ile Pro Lys Ile Leu Asp Gly Glu Asn Asn Lys Ala Ala Gly Gly
 20 2485 2490 2495
 Gly Pro Lys Gln Pro Asn Ser Gly Lys Thr Pro Gln Glu Trp Trp Lys
 2500 2505 2510
 Glu Asn Ala Lys His Ile Trp His Gly Met Ile Cys Ala Leu Thr Tyr
 2515 2520 2525
 25 Asn Thr Asp Ser Asn Gly Lys Asp Lys Lys Ile Gln Gln Val Lys Ala
 2530 2535 2540
 Thr Asp Asn Thr Asp Leu Phe Gln Lys Leu Lys Lys Asp Asn Asp Tyr
 2545 2550 2555 2560
 Glu Thr Val Ser Phe Gly Ala Ser Gly Thr Gly Ala Lys Ser Asn Asp
 30 2565 2570 2575
 Asp Thr Lys Leu Lys Asn Phe Val Val Arg Pro Thr Tyr Phe Arg Trp
 2580 2585 2590
 Leu Glu Glu Trp Gly Glu Phe Cys Arg Lys Gln Lys His Lys Leu
 2595 2600 2605
 35 Tyr Ile Ile Lys Lys Asp Cys Arg Asp Asn Lys Phe Cys Ser Gly Asp
 2610 2615 2620
 Gly Leu Arg Cys Asp Glu Lys Val Pro Asp Lys Lys Asp Ile Phe Lys
 2625 2630 2635 2640
 His Phe Asp Cys Pro Ser Cys Ala Arg His Cys Arg Ser Tyr Arg Lys
 40 2645 2650 2655
 Trp Ile Glu Arg Lys Lys Thr Glu Tyr Glu Lys Gln Glu Ser Ala Tyr
 2660 2665 2670
 Ser Lys Gln Lys Ser Asn Tyr Val Asn Gly Ser Asn Gly Asp Gly Gly
 2675 2680 2685
 45 Asn Asn Asn Asp Lys Glu Phe Tyr Thr Lys Leu Glu Thr Cys Thr Lys
 2690 2695 2700
 Ala Thr Asn Phe Leu Glu Ser Leu Lys Gly Gln Cys Ile Gly Asn Asn
 2705 2710 2715 2720
 Asn Gly Gly Thr Asp Ile Lys Phe Ser Asn Thr Asn Ile Thr Phe Gly
 50 2725 2730 2735
 Ser Ala Glu Asp Cys Lys Pro Cys Ser Glu Phe Lys Val Asn Cys Glu
 2740 2745 2750
 Asn Gly Ser Cys Gly Ser Ala Lys Gln Lys Asp Cys Pro Asn Asn Thr
 2755 2760 2765
 55 Ile Thr Ser Gln Asn Ile Lys Gly Leu Thr Asp Gln Val Asp Met Arg
 2770 2775 2780
 Val Ser Asp Asn Thr Glu Ser Gly Phe Glu Gly Asp Leu Gly Ile Cys
 2785 2790 2795 2800
 Gln Gly Ala Gly Ile Phe Lys Gly Ile Arg Lys Asp Glu Trp Lys Cys

	2805	2810	2815
	Gly Asp Phe Cys Gly Ile Asp Ile Cys Thr Leu Glu Lys Thr Asn Asn		
	2820	2825	2830
	Gly Lys Glu Ser Asp Lys Lys Tyr Ile Ile Met Lys Glu Phe Val Lys		
5	2835	2840	2845
	Arg Trp Leu Glu Tyr Phe Phe Glu Asp Tyr Asn Arg Ile Gln Lys Lys		
	2850	2855	2860
	Leu Lys Thr Cys Lys Glu Asn Gly Lys Gly Ser Thr Cys Ile Arg Ser		
	2865	2870	2875
10	2880		
	Cys Val Asp Glu Trp Ile Lys Leu Lys Lys Asp Glu Trp Gln Lys Ile		
	2885	2890	2895
	Asn Ser Asn Tyr Leu Asp Gln Asn Thr Lys Glu Asn Pro Glu Gly Asn		
	2900	2905	2910
	Asn Leu Ser Ser Phe Leu Glu Asp Gly Pro Phe Lys Asn Glu Val Asp		
15	2915	2920	2925
	Lys Ala Ile Lys Pro Cys Gly Asn Leu Thr Asp Phe Lys Lys Ser Lys		
	2930	2935	2940
	Lys Cys Asn Gly Thr Ser Arg Ser Gly Asn Ser Glu Glu Ser Thr Lys		
	2945	2950	2955
20	2960		
	Tyr Asp Gly Val Ile Cys Leu Leu Asp Asn Leu Lys Asn Ile Ile Lys		
	2965	2970	2975
	Thr Cys Gln Asn Val Pro Ser Gly Lys Pro Asp Thr Pro Cys Gln Lys		
	2980	2985	2990
	Ser Pro Ala Pro Val Gly Asp Asp Asp Pro Leu Glu Glu Glu Asn		
25	2995	3000	3005
	Pro Val Thr Gln Pro Asn Ile Cys Pro Gln Thr Ser Val Glu Glu Lys		
	3010	3015	3020
	Lys Lys Glu Glu Glu Lys Cys Asp Glu Lys Glu Glu Glu Glu		
	3025	3030	3035
30	3040		
	Lys Glu Glu Glu Lys Asp Lys Gly Asp Glu Glu Val Lys Glu Glu Glu		
	3045	3050	3055
	Lys Asp Lys Gly Asp Glu Glu Glu Ala Glu Glu Glu Glu Glu		
	3060	3065	3070
	Glu Glu Glu Thr Asp Ser His Ile Tyr Glu Asp Tyr Ser Asp Ser Asp		
35	3075	3080	3085
	Ala Glu Glu Asp Asp Glu Asp Glu Ala Val Thr Glu Ser Leu Ser Pro		
	3090	3095	3100
	Ser Glu Ser Gln Pro Lys Arg Leu Leu Arg Glu Phe Pro Ser Pro Glu		
	3105	3110	3115
40	3120		
	Leu Lys Asn Ala Met Leu Phe Ser Thr Ile Leu Trp Met Val Gly Ile		
	3125	3130	3135
	Gly Phe Ala Ala Phe Thr Tyr Phe Phe Leu Lys		
	3140	3145	